Interstage

FUJITSU

Interstage Business Process Manager V11.0

Server and Console Installation Guide (WebSphere Application Server)

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About this Manual

This manual describes how to configure the system environment and install the Interstage Business Process Manager (Interstage BPM) Server and Console.

Note that the Interstage BPM Tenant Management Console is automatically deployed when you deploy Interstage BPM Console.

Intended Audience

This manual is intended for Interstage BPM Super Users, who are administrators managing Interstage BPM Server. It assumes that the reader has a working knowledge of

- Operating system administration
- Application server administration
- Database administration
- Directory Service administration

This Manual Contains

Here is a list of what is in this manual:

Chapter	Title	Description
1	System Configurations for Interstage BPM Server	Description of the typical system configurations for the installation of Interstage BPM Server.
2	System Configurations for Interstage BPM Console	Description of the typical system configurations for the installation of Interstage BPM Console.
3	System Requirements for Interstage BPM Server and Console	Description of the minimum system requirements by platform.
4	Overview of Integrated Deployment of Interstage BPM Server and Console	An overview of using the new integrated Deployment Tool
5	Preparing for Installation and Deployment of Interstage BPM Server and Console	Instructions for preparing external systems like the database or the application server.
6	Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server	Instructions for performing installation of Interstage BPM Server with Console, or only Interstage BPM Server.
7	Deploying only the Interstage BPM Console	Instructions for performing deployment of only Interstage BPM Console

Chapter	Title	Description
8	Undeploying and Uninstalling Interstage BPM Server and Console	Instructions for removing an instance of Interstage BPM Server and Console from the application server and for uninstalling Interstage BPM
9	Upgrading Interstage BPM Server from Previous Versions	Instructions for performing an upgrade.
10	Setting Up a Directory Service	Instructions for setting up your Directory Service.
Appendix A	Security	Instructions for security implementation on Interstage BPM.
Appendix B	Silent Mode Installation	Instructions for using the Silent Mode installation feature of Interstage BPM.
Appendix C	Silent Mode Deployment	Instructions for running the Interstage BPM Deployment Tool in Silent Mode.
Appendix D	Web Services Interfaces	Information about Command Interface Web Services
Appendix E	Clustering, Load Balancing, and Failover	Instructions for setting up a cluster of Interstage BPM Servers.
Appendix F	Troubleshooting	Information to help you troubleshoot problems associated with using Interstage BPM.

Screenshots of the products that appear in this manual are approximations only. What you see when using the product may differ in appearance due to platform or product version differences.

Typographical Conventions

The following conventions are used throughout this manual:

Example	Meaning
`command`	Text, which you are required to type at a command line, is identified by `Courier` font.
screen text	Text, which is visible in the user interface, is **bold**.
Reference	Reference material is in *italics*.
`Parameter`	A command parameter is identified by `Courier` font.

Other References

The following references for Interstage Business Process Manager are also available:

- *Release Notes*

  Contains an overview of Interstage Business Process Manager, installation tips, and late-breaking information that could not make it into the manuals.

- *Interstage Business Process Manager Server and Console Installation Guide*

  Describes software and hardware requirements, installation procedure for Interstage Business Process Manager Server and Console

- *Interstage Business Process Manager Server Administration Guide*

  Explains how to configure and administrate Interstage Business Process Manager Server. This guide also describes the configuration parameters of the Interstage BPM Server.

- *Interstage Business Process Manager Developer's Guide*

  Describes how to use the Interstage Business Process Manager API to customize and extend Interstage BPM to fit the unique needs of your organization.

- *Interstage Business Process Manager Studio User's Guide*

  Explains how to model processes using the Interstage Business Process Manager Studio.

- *Interstage Business Process Manager Tenant Management Console Online Help*

  Explains how to use the Interstage Business Process Manager Tenant Management Console user interface.

- *Interstage Business Process Manager Console Online Help*

  Explains how to use the Interstage Business Process Manager Console user interface.

- *Interstage Business Process Manager ARIS Process Performance Manager Integration Guide*

  Describes how to install and configure the PPM adapter and the PPM autoConfig tool. With both programs, process data can be transferred from Interstage Business Process Manager to ARIS Process Performance Manager.

- *API Javadoc Documentation*

  This HTML documentation provides the API and syntax of the packages, interfaces and classes for developing custom applications or embedding Interstage Business Process Manager into other products.

Abbreviations

The products described in this manual are abbreviated as follows:

- "ARIS Process Performance Manager" is abbreviated as "ARIS PPM".
- "Interstage Business Process Manager" is abbreviated as "Interstage BPM".
- "Microsoft® Windows Server® 2003" is abbreviated as "Windows Server® 2003".
- "Solaris ™ Operating System" is abbreviated as "Solaris".
- "Microsoft® SQL Server 2005 Standard Edition", and "Microsoft® SQL Server 2005 Enterprise Edition", "Microsoft® SQL Server 2008 Standard Edition", and "Microsoft® SQL Server 2008 Enterprise Edition" are abbreviated as "Microsoft® SQL Server","Microsoft SQL Server", or "SQL Server".

- "Oracle 10g R2 Standard Edition", "Oracle 10g R2 Standard Edition One", "Oracle 10g R2 Enterprise Edition", "Oracle 11g Standard Edition", "Oracle 11g Standard Edition One", "Oracle 11g Enterprise Edition" are abbreviated as "Oracle".
- "WebSphere Application Server" is abbreviated as "WebSphere".

1 System Configurations for Interstage BPM Server

Interstage Business Process Manager (Interstage BPM) is a server-based workflow engine with APIs (Application Programming Interfaces) for workflow application development.

The Interstage BPM Server runs on an application server providing load balancing and failover capabilities, and it operates with a database, which persistently stores and maintains all process information.

A user and group store is required to manage Interstage BPM user accounts and to expand a group into a list of users. Depending on your choices when deploying the server, users are managed either in Interstage BPM's local user store or in a Directory Service. Groups can be managed in Interstage BPM's local group store, in a Directory Service or in both systems.

The Interstage BPM Server is shipped with a Deployment Tool, which is used to

- Configure the database, the application server and the Interstage BPM Server
- Deploy the Interstage BPM Server to the application server
- Deploy the Interstage BPM Console to the application server

The system configurations described in the next sections are typically used. The decision of the configuration to be used depends on the desired performance of the employed systems.

1.1 Minimum Configuration: All Systems on the same Computer

You can install the Interstage BPM Deployment Tool, the Interstage BPM Server, the database, and, if you plan to use a remote user store, the Directory Service on the same computer.

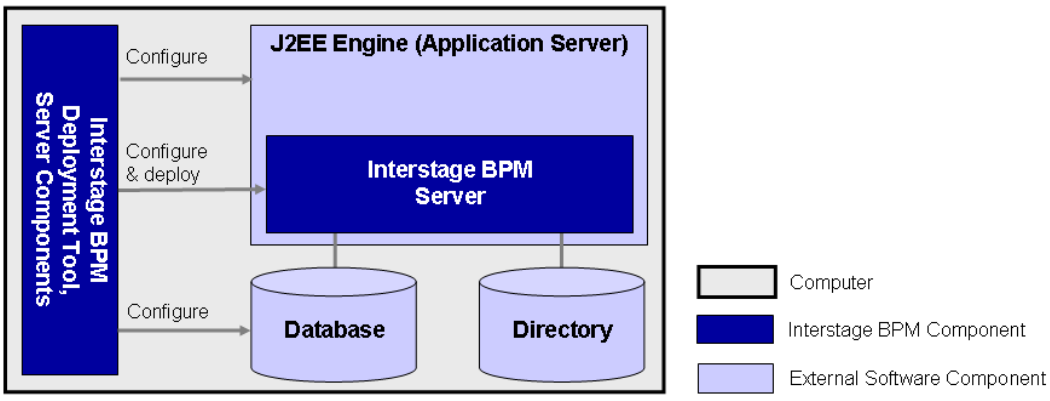

Figure 1: All systems on the same computer

For details about the architecture of Interstage BPM, refer to the *Interstage Business Process Manager Server Administration Guide.*

1.2 Database on Remote Computer

The following figure shows a configuration where the Interstage BPM Server and the database are installed on separate computers.

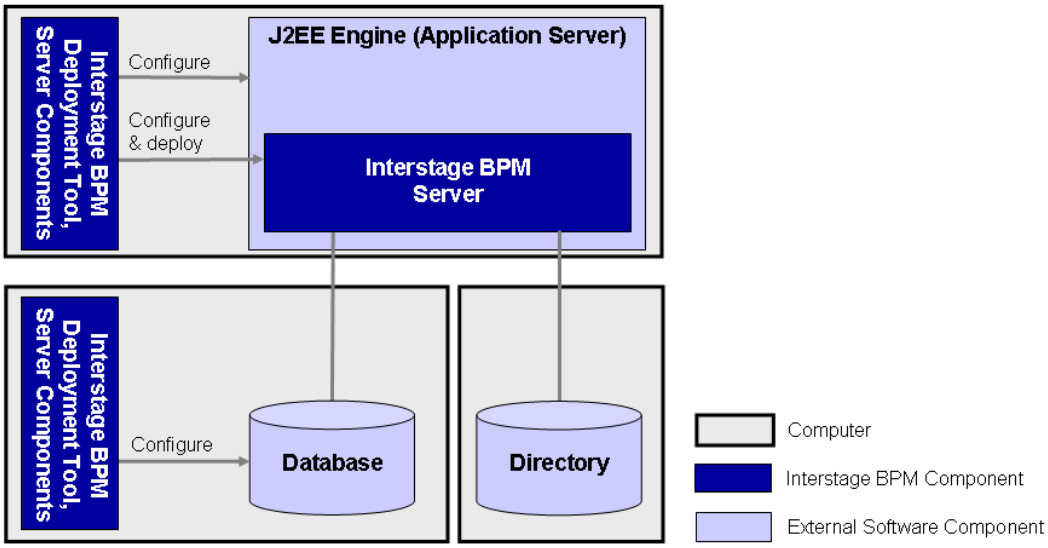

Figure 2: Database on Remote Computer

To set up this configuration, you install the Interstage BPM Server software on the computer hosting the database and use the Deployment Tool to configure the database.

Next, you install the Interstage BPM Server software on the computer hosting the application server. The Interstage BPM Deployment Tool can then be run from that computer to configure the application server and deploying the Interstage BPM Server to the application server.

In the configuration shown above, the Directory Service is also installed on a remote computer. However, this has no impact on the Interstage BPM installation procedure.

2 System Configurations for Interstage BPM Console

The Interstage BPM Console is the Client that connects to the Interstage BPM Server.

The Interstage BPM Console must run on the same type of application server as the Interstage BPM Server to which it connects.

The system configurations described in the next sections are typically used. The decision of the configuration to be used depends on the desired performance of the employed systems.

2.1 Minimum Configuration: All Systems on the same Computer

You can install the Interstage BPM Server and Console on the same computer.

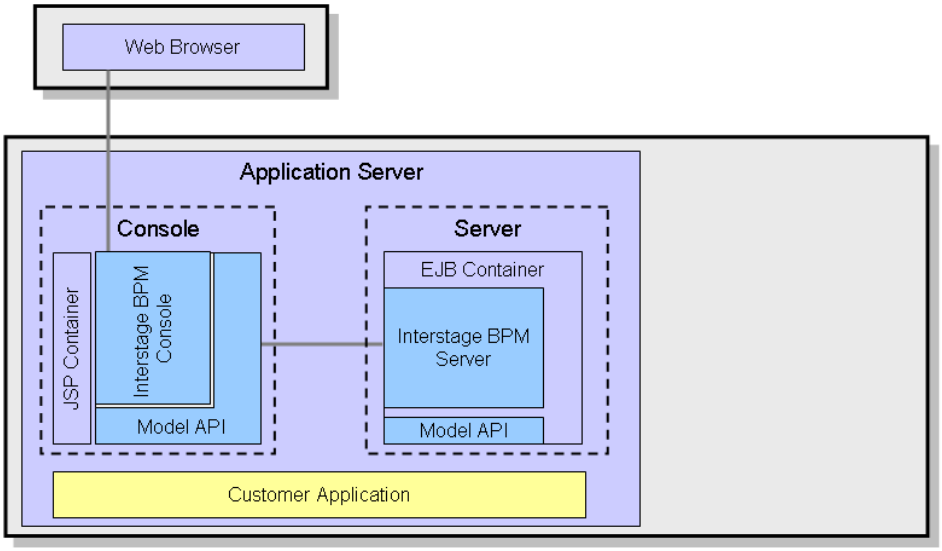

Figure 3: All systems on the same computer

For details about the architecture of the Interstage BPM Server, refer to the *Interstage Business Process Manager Server Administration Guide* .

3 System Requirements for Interstage BPM Server and Console

3.1 Hardware Requirements for Interstage BPM Server and Console

Machine and Processor

Operating System	Machine	Processor
Windows	Fujitsu PRIMERGY or other Intel Architecture servers	Minimum: Intel® Pentium III processor, 1 GHz, 1 CPU or greater Recommended: Intel® Pentium III processor, 2 GHz, 2 CPU or greater
Solaris	Fujitsu PRIMEPOWER or other Solaris servers	Minimum: Ultra SPARC or SPARC64 V (kernel arch: sun4u/sun4us/sun4d) 1 GHz, 1 CPU or greater Recommended: SPARC 1.2GHz, 2CPU or greater
Linux	Fujitsu PRIMERGY or other Intel Architecture server	Minimum: Intel® Pentium III processor, 1 GHz, 1 CPU or greater Recommended: Intel® Pentium III processor, 2 GHz, 2 CPU or greater

Memory

Minimum: 1 GB

Recommended for Server: 2 GB or more

Recommended for Console: 4 GB or more

Hard Drive

Recommended for Server: 8 GB of free space during runtime (at least 1 GB must be available in the /tmp directory)

(Please refer the calculation method below)

Interstage BPM installation: 200 MB

Log file space: Depends on the number of active users. As a rule of thumb, with the default log level, calculate 5 KB for each user logging in. For example, if 1000 users log in per day, the log file increases by 5 MB per day.

Database server installation: Please refer to the product documentation.

Database space:

As a rule of thumb, 1000 instances of a process definition with 10 nodes require about 5 MB. During Interstage BPM runtime, the processing of work items, history entries in the database, etc., require additional space besides the initial database size. This additional space depends on 1) the number

of process instances 2) the number of active nodes 3) the number of users who are assigned to work items.

For example, if you have 1000 instances of a process with 10 nodes, 50% of the nodes require parallel processing (e.g. OR nodes), 10 users are accessing the process instances, you need the following disk space at runtime:

1500 active nodes multiplied with 10 users: 15,000 KB or 15 MB

3.2 Minimum Software Requirements for Server and Console

For software requirements for the server, refer to the *Interstage BPM Server Release Notes*.

For software requirements for the Console, refer to the *Interstage BPM Console Release Notes*.

3.3 Hardware Requirements for Browser

Machine

Fujitsu DESKPOWER, ESPRIMO, SCENIC, SCALEO, CELCIUS, Lifebook, AMILO, PRIMERGY or other Windows PC / Intel Architecture servers

Processor

Pentium III 500 MHz or greater

Memory

Minimum: 512 MB, Recommended: 2 GB or more

3.4 Minimum Software Requirements for Web Browser Clients

For software requirements for the client machines connecting to the Console remotely, refer to the Release Notes.

4 Overview of Integrated Deployment of Interstage BPM Server and Console

You can deploy Interstage BPM Server and Console together using the integrated Deploment Tool. The Deployment Tool offers the following possible combinations of deploying Server and Console.

Possible Combinations of Deploying Interstage BPM Server and Console

1. Deploying Server and Console together

   Refer sections *Preparing for Installation and Deployment of Interstage BPM Server and Console* on page 18 and *Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server* on page 23

2. Deploying only the Server

   Refer sections *Preparing for Installation and Deployment of Interstage BPM Server and Console* on page 18 and *Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server* on page 23

3. Deploying only the Console, after having deployed the Server

   Refer section *Deploying only the Interstage BPM Console* on page 64

Note: When you deploy Interstage BPM Console, Interstage BPM Tenant Management Console is automatically deployed as well.

Note: If you are upgrading from a previous version of Interstage BPM, refer *Upgrading Interstage BPM from Previous Versions* on page 75.

5 Preparing for Installation and Deployment of Interstage BPM Server and Console

This chapter explains how to set up your environment before installation and deployment of Interstage BPM.

Note: Use this chapter if you plan to install and deploy Interstage BPM Server together with Console, OR, only the Server.

If you have already completed deployment of Interstage BPM Server, and plan to deploy only Interstage BPM Console, refer section *Preparing for Console Deployment*

5.1 Database Server Preparation

This section provides instructions in configuring your database software for use by Interstage BPM. You must create a new database instance for Interstage BPM. When deploying the Interstage BPM Server, you will specify this instance. These instructions use the default database instance for the purpose of providing an example.

5.1.1 Configuring Microsoft® SQL Server

Microsoft® SQL Server 2005 or Microsoft® SQL Server 2008 can be used as the database with Interstage BPM.

To configure Microsoft SQL Server:

1. Make sure that you install Microsoft® SQL Server in Mixed Mode.

   Microsoft® SQL Server in Mixed Mode allows Windows Authentication, i.e. a Windows user can log in to the database, and Microsoft® SQL Server Authentication, i.e. a user needs a user name and a password for the database.

Note: If Microsoft® SQL Server is already installed, you may have to run the setup program again if the default selection from the prior installation enabled Named Pipes. Run the Microsoft® SQL Server setup again and add TCP/IP. However, do not disable Named Pipes. Both must be selected.

2. Confirm that **TCP/IP** is selected under Network Operations.
3. Determine the port number of the Microsoft® SQL Server instance that Interstage BPM will connect to. To do so:
   a) Select **Start** > **Programs** > **Microsoft SQL Server 2005/2008** > **Configuration Tools** > **SQL Server Configuration Manager**.
   b) Navigate to **SQL Server Network Configuration** > **Protocols for <MSSQLInstance>**.

      For the default instance, the value of `<MSSQLInstance>` is `MSSQLSERVER`.

   c) Confirm that TCP/IP is enabled. Then, go to the TCP/IP properties and click the **IP Addresses** tab.

      The **IPAll** section displays the **TCP port** and **TCP Dynamic Ports** parameters.

   d) If you are using the default Microsoft® SQL Server instance, note down the value of **TCP Port**. If you are using a named instance, note down the value of the **TCP Dynamic Ports**. You will need to specify the port number later when deploying the Interstage BPM Server.
4. Install the SQL Server Driver for JDBC.

Microsoft does not provide a JDBC driver with Microsoft SQL Server, so you must obtain the latest service pack of the SQL Server Driver for JDBC from the Microsoft Web Site and install it using the instructions provided on the download page. For information about supported versions of the driver, refer to the *Release Notes*.

The `sqljdbc.jar` file is the actual driver.

You will need to specify the driver location later when deploying the Interstage BPM Server.

5. If you are running your database on a remote computer, copy the JDBC driver `sqljdbc.jar` into a new directory on the application server computer.

   Create a directory with an identifiable name because you must specify it as the driver location during the deployment of the Interstage BPM Server.

6. On the computer where Microsoft® SQL Server is installed, make sure that a J2SE Development Kit (JDK) or Java Runtime Environment (JRE) is installed.

   For information about supported versions, refer to the *Release Notes*.

Microsoft® SQL Server is now configured.

Note: If you change the default datapath for the Microsoft® SQL Server instance, make sure that you specify a directory on a local disk. The default datapath is the location where new databases will be stored.

5.1.2 Configuring Oracle

Prerequisite: Oracle is installed.

To configure Oracle for Interstage BPM:

1. On the computer where Oracle is installed, make sure that a J2SE Development Kit (JDK) or Java Runtime Environment (JRE) is installed.

   For information about supported versions, refer to the *Release Notes*.

Note: Ensure that the value of the environment variable ORACLE_HOME is set to the path of the Oracle installation directory for UNIX environment.

2. Create a new database instance for Interstage BPM.

   When deploying the Interstage BPM Server, you will specify this instance. The default database instance for Oracle is `orcl`.

Note: Make sure that the database instance is created with the following character sets:

- AL32UTF8 as the database character set
- AL16UTF16 as the national character set

These settings are required to support Unicode UTF-16 characters.

   Refer to the Oracle documentation for instructions on how to install Oracle and a database instance.

3. For performance reasons, the following settings are required:
   - The database instance must be configured with at least 1 GB System Global Area (SGA) size.
   - The database statistics must be up-to-date. Depending on the number of changes, it might be appropriate to collect the statistics explicitly although the database server is doing this automatically every 24 hours per default.

4. Make sure that a TCP/IP version of Oracle's SQL*Net is installed.

   The Oracle JDBC driver requires a TCP/IP version of Oracle's SQL*Net. This is the default for a standard installation.

Note: If you need to uninstall Oracle or require recovery from a failed installation, contact Oracle Technical Support for instructions before reinstalling.

5. Make sure that you know the TCP/IP port number of the database.

   The port number is typically set to 1521.

6. On the database server computer, create a directory in which the Interstage BPM database will reside.

   Later, when running the Interstage BPM Deployment Tool, you will specify this directory as the location of the data files.

Note: The user who will perform the database setup using the Deployment Tool must have write permissions for this directory.

7. If you are running your **database on a remote computer**, you are recommended to make Oracle's JDBC driver (`ojdbc14.jar` for Oracle 10g, `ojdbc5.jar` for Oracle 11g) available on the application server computer. To do so:

   Copy the JDBC driver file, typically located in the `<ORACLE_HOME>/jdbc/lib` directory, into a new directory on the application server computer.

   Create a directory with an identifiable name because you must specify it as the driver location during the deployment of the Interstage BPM Server.

   Example on Windows: `C:\myOracleJDBCJar`.

   Example on Solaris: `/usr/lib/myOracleJDBCJar`.

   Example on Linux: `/usr/lib/myOracleJDBCJar`.

Note: In the directory into which you copied the driver file, change the file permission of the driver file to 666 (ugo=rw) if you are installing on the following operating system:

- Solaris
- Linux

Note: If you intend to use Oracle 11g, make sure that Oracle's JDBC driver version is V11.1.0.7 or higher. If not, get the JDBC driver having version V11.1.0.7 or higher, and use it.

Oracle is now configured.

5.1.3 Starting the Database Server

Since configuration information must be written to the database during deployment, ensure that the database server is running prior to deploying Interstage BPM Server. Start the database server according to the documentation provided with your database server.

5.2 Installing and Starting WebSphere Application Server

Note:
- You must have full administrative privileges on the system upon which you are installing WebSphere to perform any of the instructions described in this section.
- Your operating system user name must be 12 characters or less in length.
- Interstage BPM for WebSphere will not work properly on a computer with a hyphen (-) or white space in its computer name.
- Do not install WebSphere under a directory containing blanks in its name. If you do, you will not be able to properly configure your Java Plug-in, so your Interstage BPM Clients will not work properly.

  For example, on Windows, do not install WebSphere under the `C:\Program Files` directory.
- Refer to the Release Notes for the exact WebSphere versions and editions that are supported by Interstage BPM.

To prepare the WebSphere Application Server:

1. Install WebSphere Application Server according to the WebSphere installation documentation.

   When installing WebSphere Application Server 6.1 Network Deployment (ND) Edition, on the **WebSphere Application server environments** screen, select the **Application Server** environment.

2. Start the WebSphere Application Server using the startup script located in `<WebSphere Installation Directory>/AppServer/bin`:

Operating System	Startup Script
Windows	`startServer.bat <Server Name>` Example: `startServer.bat server1`
Solaris	`startServer.sh <Server Name>` Example: `startServer.sh server1`
Linux	`startServer.sh <Server Name>` Example: `startServer.sh server1`

   On Windows, you can also start the application server using the following menu path:

WebSphere Edition	Menu Path
WebSphere Application Server Base Edition	**Start** > **Programs** > **IBM WebSphere** > **Application Server Base V6.1** > **Profiles** > **AppSrv01** > **Start the server**
WebSphere Application Server Network Deployment (ND) Edition	**Start** > **Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Start the server**

Note: These instructions must be modified if you are using a WebSphere server other than the default server `server1`. Refer to your WebSphere installation instructions for the details on this.

If everything has been installed correctly, the WebSphere Application Server starts.

6 Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server

Use the information in this chapter if:

- You plan to install and deploy Interstage BPM Server and Console together
- You plan to install and deploy only the Interstage BPM Server

Note: When you deploy Interstage BPM Console, Interstage BPM Tenant Management Console is also automatically deployed.

For other combinations, refer *Overview of Integrated Deployment of Interstage BPM Server and Console* on page 17

Interstage BPM comes with an installation program and a Deployment Tool. The installation program installs the product documentation, the Deployment Tool and all files required for subsequent deployment of the Interstage BPM Server and Console to an application server of your choice. The Deployment Tool walks you through the required configuration steps and performs the actual deployment to an application server.

This chapter explains how to perform server and console installation using the installation program and the Deployment Tool in graphical mode.

Installation and deployment is a short, smooth process if you know the overall procedure and all of the values for the parameters that you need to supply. It is recommended that you take the time to fill out the installation and deployment worksheet before and read the overview of the installation and deployment procedure before starting the installation.

Refer to *System Requirements for Interstage BPM Server and Console* on page 15 and to the Release Notes for details on the required components mentioned in the procedures described in this chapter.

Note: If you install Interstage BPM Server on a computer that is periodically disconnected from the network, your computer's DHCP lease may expire while you are off line. If this happens, TCP/IP (and therefore Interstage BPM Server) will cease functioning. Therefore, you should use a static IP address for the computer.

If you want to change the Interstage BPM configuration after deployment, you can do so by following the instructions in the *Interstage Business Process Manager Server Administration Guide*.

6.1 Installation and Deployment Worksheet

During the course of the installation and the deployment you will be asked to enter values for a number of parameters. To ensure a smooth and easy setup, it is recommended that you fill out the following worksheet before beginning the installation.

Interstage BPM Server Settings

Interstage BPM Installation Setting	Your Value
Installation directory of Interstage BPM Default on Windows: `C:\Fujitsu\InterstageBPM` Default on Solaris: `/opt/FJSVibpm` Default on Linux: `/opt/FJSVibpm`	
Location of the J2SE Development Kit (JDK) or Java Runtime Environment (JRE) (top-level directory)	

WebSphere Application Server Settings

WebSphere Application Server Setting	Your Value
Location of the application server profile Example: `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01`	
Node name Example: `<Computer Name>Node01`	
Cell name Example: `<Computer Name>Node01Cell`	
Interstage BPM Server name Example: `server1`	
Username of the application server administrator	
Password of the application server administrator	
Location of the JDK shipped with WebSphere Example: `<WebSphere Installation Directory>/AppServer/java`	

Interstage BPM Console Settings

Interstage BPM Console Setting	Your Value
ServerBaseURL, in the format `http://<ConsoleHost>:<ConsolePort>/console/` Example: `http://docone:49950/console/`	

Interstage BPM Console Setting	Your Value
ServerEmailBaseURL, in the format `http://<ConsoleHost>:<ConsolePort>/console/` Example: `http://docone:49950/console/`	

Database Settings - Microsoft SQL Server

Database Setting - Microsoft SQL Server	Your Value
User name of a non-administrative database user account Example: `ibpmuser`	
Password of the non-administrative database user account	
Database instance name	
Database server host name or IP address of the server that hosts the database instance	
Database port number Default: 1433	
Database administrator password	
Package name of the JDBC driver class, typically `com.microsoft.sqlserver.jdbc.SQLServerDriver`	
Database connection URL, typically `jdbc:sqlserver://<Hostname>:<Database Port>;databaseName=teamflowdb`	
Location of the database JDBC driver `sqljdbc.jar` Example: `C:\MicrosoftSQLServer 2005JDBCDriver\sqljdbc_1.2\enu`	
Database top-level directory, typically `C:\Program Files\Microsoft SQL Server`	
Database directory, typically `C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Data`	
Location of a JDK or JRE installation on the database server computer	

Database Settings - Oracle

Database Setting - Oracle	Your Value
User name of a non-administrative database user account Example: `ibpmuser`	
Password of the non-administrative database user account	
Host name or IP address of the computer that hosts the database instance	
Connection identifier of the database, typically the database name	
Database port number	
Password of the `SYSTEM` user	
Package name of the JDBC driver class Example: `oracle.jdbc.driver.OracleDriver`	
Database connection URL Example: `jdbc:oracle:thin:@localhost:1521:ORCL`	
Location of the database JDBC driver (`ojdbc14.jar` for Oracle 10g, `ojdbc5.jar` for Oracle 11g) Example: `<ORACLE_BASE>/product/10.1.0/db_1/jdbc/lib`	
Database top-level directory Example: `<ORACLE_BASE>/product/10.1.0/db_1` This directory is also referred to as `<ORACLE_HOME>`.	
Database directory Example on Windows: `C:\Oracle\Product\10.2.0\oradata\<Database Name>` Example on Solaris: `/u01/oradata/<Database Name>` Example on Linux: `/u01/oradata/<Database Name>`	
Location of a JDK or JRE installation on the database server computer	

Interstage BPM Super User Account

Interstage BPM Server Setting	Your Value
User name Example: `ibpm_server1`	
Password	

Interstage BPM Tenant Owner Account

The following information is not needed if you choose the SaaS mode but choose not to set up a default tenant.

Interstage BPM Server Setting	Your Value
Tenant Owner name Example: `default_tenant`	
Password	

Directory Service Settings - Microsoft Active Directory

The following configuration information is only needed if using Microsoft Active Directory.

Directory Service Setting	Your Value
Directory Service host name or IP address (local or remote)	
Directory search string Example: `dc=fujitsu, dc=com`	
Organizational unit Example: `ou=Groups`	
Directory Service port number (not the admin port number) Example: 389	

Directory Server Settings - Sun Java System Directory Server

The following configuration information is only needed if using Sun Java System Directory Server.

Directory Server Setting	Your Value
Directory Server host name or IP address (local or remote)	
Directory search string Example: `dc=fujitsu, dc=com`	

Directory Server Setting	Your Value
Organizational unit Example: `ou=Groups`	
Directory Server port number (not the admin port number) Example: 389	

Mail Server Settings

Mail Server Setting	Your Value
SMTP server host name **Note**: If you do not enter a SMTP server host name, Interstage BPM's email notification feature will be disabled. Consult your system administrator and your email Administrator for the correct host names, since the Interstage BPM Server will not start if the SMTP server host name is incorrect. If you are in doubt, leave this field blank and change the configuration of the Interstage BPM Server later. Refer to the *Interstage Business Process Manager Server Administration Guide* for details.	
Interstage BPM Tenant Owner's email address (can be any active email address)	

WebDAV and UDDI Server Settings

WebDAV and UDDI Server Setting	Your Value
URL for WebDAV Repository	
Name of a user that has administrative rights to publish to the WebDAV	
Password of that user	
UDDI Business Name	
URL to which UDDI Registry information will be published	
Name of a user that has administrative rights to publish UDDI Registry information to the organization specified as UDDI Business Name	
Password of that user	
URL that allows to search the UDDI Registry	

6.2 Permissions Required for Installation and Deployment

Permissions Required for Installation

You must have read, write and execute permissions on the installation directory of the Interstage BPM Server and Console.

Note: On Solaris, if you are installing as a non-root user, Interstage BPM Server will not be installed as a package.

Permissions Required for Deployment When Using Oracle

- You must have execute permissions for the `sqlplus` file located in the `<ORACLE_HOME>/bin` directory.
- You must have write permissions for the directory in which the Interstage BPM database will reside.
- The `ORACLE_HOME` environment variable must be set to the installation directory of the database server if you are deploying on
  - Solaris
  - Linux

  Example: `ORACLE_HOME=/opt/oracle/app/oracle/product/10.2.0/db_1`

  You can either set the environment variable in your `~/.profile` file or in the shell before starting the Deployment Tool.

Note: If you set the environment variable in the shell, run the `set -a` command so that the environment variable is set for all subshells created from the parent shell.

6.3 Overview of the Installation and Deployment Procedure

This section summarizes the steps required to install and deploy the Interstage BPM Server with the Console, or just the Server. The installation and deployment procedure depends on whether the database and the application server are installed on the same or on different computers.

To connect to a Directory Service and log into Interstage BPM (except for the default Interstage BPM user created during deployment), you must configure and start the Directory Service before starting the Interstage BPM Server. The best time for configuration is after deploying and before you start the Interstage BPM Server, because the Deployment Tool creates an Interstage BPM LDIF file that you need to import into the Directory Service.

Note: If you are upgrading from a previous version of Interstage BPM, refer *Upgrading Interstage BPM from Previous Versions* on page 75.

Running the Database and Interstage BPM Server on the Same Computer

1. Prepare the database and make sure that the database server is running.
   Refer to section *Database Server Preparation* on page 18.
2. Prepare the application server and make sure that it is running.
   Refer to section *Installing and Starting WebSphere Application Server* on page 21.

3. Install Interstage BPM.
   Refer to section *Installing Interstage BPM* on page 31.
4. Configure the Interstage BPM Server and Console (or only the Server), and deploy it to the application server.
   Refer to section *Deploying Server Instances with Console, OR only Server Instances* on page 39.
5. If you want to connect to a Directory Service, you must configure it before starting the Interstage BPM Server.
   Refer to chapter *Setting Up a Directory Service* on page 82.
6. If you opted for SaaS mode during Server deployment, switch on Java security.
   Refer to section *Switching on Java Security* on page 57.
7. Start the Interstage BPM Server.
   Refer to section *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58
8. If you have also deployed the Console, start Interstage BPM Console
   Refer to section *Starting Interstage BPM Console and Tenant Management Console* on page 61
9. If required, perform further configurations for Interstage BPM Console
   Refer section *Interstage BPM Console - Other Configurations* on page 66

Running the Database and Interstage BPM Server on Different Computers

1. Prepare the database and make sure that the database server is running.
   Refer to section *Database Server Preparation* on page 18.
2. Prepare the application server and make sure that it is running
   Refer to section *Installing and Starting WebSphere Application Server* on page 21.
3. Install Interstage BPM on the **database server computer**.
   Refer to section *Installing Interstage BPM* on page 31.
4. On the **database server computer**, run the Deployment Tool to configure the database.
   Refer to section *Configuring the Remote Database* on page 38.
5. Install Interstage BPM on the **application server computer**.
   Refer to section *Installing Interstage BPM* on page 31.
6. On the **application server computer**, run the Deployment Tool to deploy the Interstage BPM Server and Console (or only the Server).
   Refer to section *Deploying Server Instances with Console, OR only Server Instances* on page 39.
7. If you want to connect to a Directory Service, you must configure it before starting the Interstage BPM Server.
   Refer to chapter *Setting Up a Directory Service* on page 82.
8. If you opted for SaaS mode during Server deployment, switch on Java security.
   Refer to section *Switching on Java Security* on page 57.
9. Start the Interstage BPM Server.

Refer to section *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58

10. If you have also deployed the Console, start Interstage BPM Console
    Refer to section *Starting Interstage BPM Console and Tenant Management Console* on page 61
11. If required, perform further configurations for Interstage BPM Console
    Refer section *Interstage BPM Console - Other Configurations* on page 66

6.4 Installing Interstage BPM

Use the instructions in this section to perform a new installation of Interstage BPM.

Note: If you have a previous version of Interstage BPM Server on your computer, refer to chapter *Upgrading Interstage BPM from Previous Versions* on page 75.

To install Interstage BPM:

1. Read the Release Notes located in the top-level directory of the CD-ROM.
2. Start the installation program located in the `engine` directory on the CD-ROM.

Operating System	Installation Program
Windows	`setupwin32.exe`
Solaris	`setupSolaris.bin`
Linux	`setupLinux.bin` **Note:** If you receive an error while launching the installation program on Linux, download the `libXp-1.0.0-8.i386.rpm` package from your Red Hat Enterprise Linux CD or the Red Hat Network website and install the package using the `rpm -i libXp-1.0.0-8.i386.rpm` command. Then, retry starting the Interstage BPM installation program for Linux.

3. Read the **Welcome** screen and click **Next**.
4. On the **Interstage Business Process Manager Installation Directory** screen, specify a directory where the Interstage BPM software is to be installed. Accept the default or click **Browse** and navigate to a directory of your choice.
   Default on Windows: `C:\Fujitsu\InterstageBPM`
   Default on Solaris: `/opt/FJSVibpm`
   Default on Linux: `/opt/FJSVibpm`

Note: The installation directory path must not contain blanks. Do not specify an installation directory path that is longer than 255 characters.

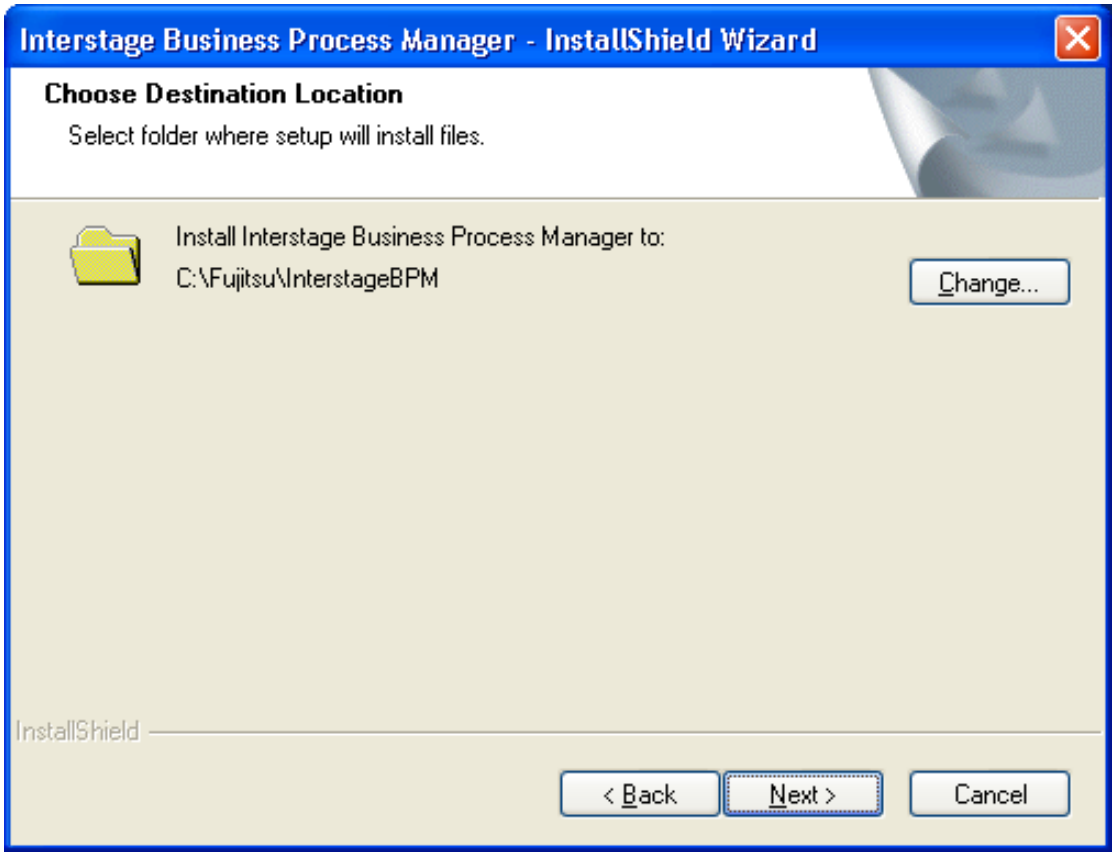

Figure 4: Server Installation Directory (for Windows)

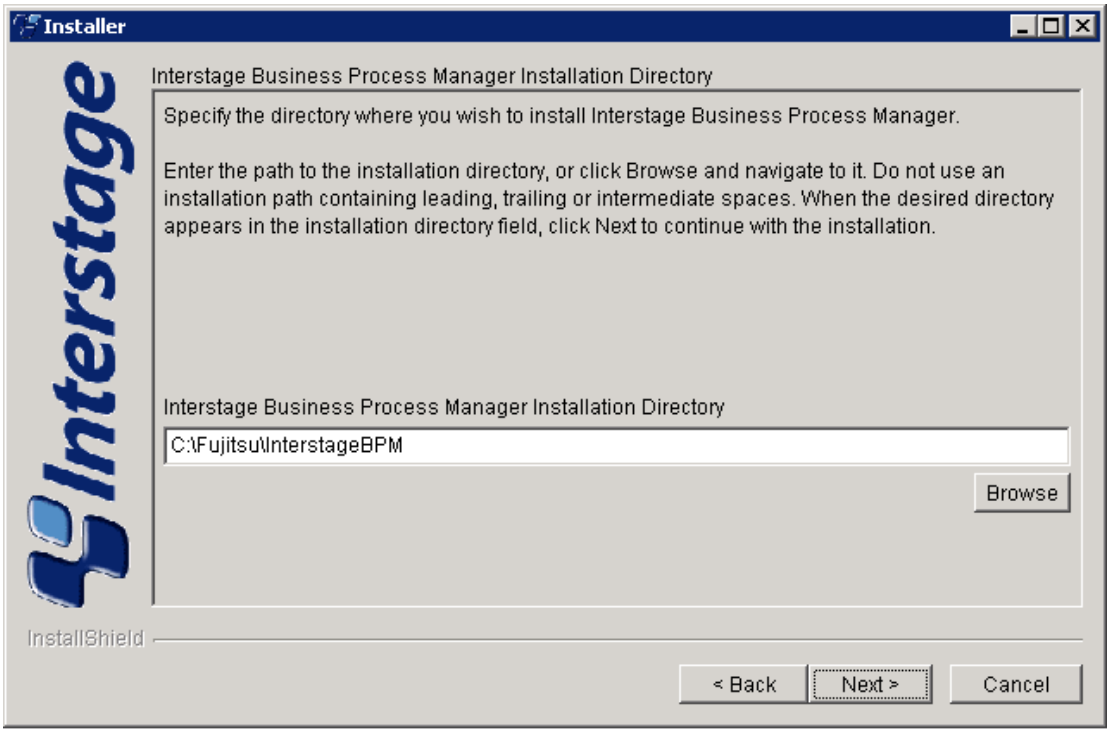
Installer
Interstage
Interstage Business Process Manager Installation Directory
Specify the directory where you wish to install Interstage Business Process Manager.
Enter the path to the installation directory, or click Browse and navigate to it. Do not use an installation path containing leading, trailing or intermediate spaces. When the desired directory appears in the installation directory field, click Next to continue with the installation.
Interstage Business Process Manager Installation Directory
C:\Fujitsu\InterstageBPM
Browse
InstallShield
< Back
Next >
Cancel

Figure 5: Server Installation Directory (for Solaris, Linux)

5. Click **Next**.
6. On the **Java Development Kit (JDK) Location** screen, specify the top-level directory of your J2SE Development Kit (JDK) or Java Runtime Environment (JRE) installation. If the default directory is not the top-level directory of your JDK or JRE installation, click **Browse** and navigate to it.

   For information on the supported JDK and JRE version, refer to the *Release Notes*.

Note: The JDK or JRE installation path must not contain blanks.

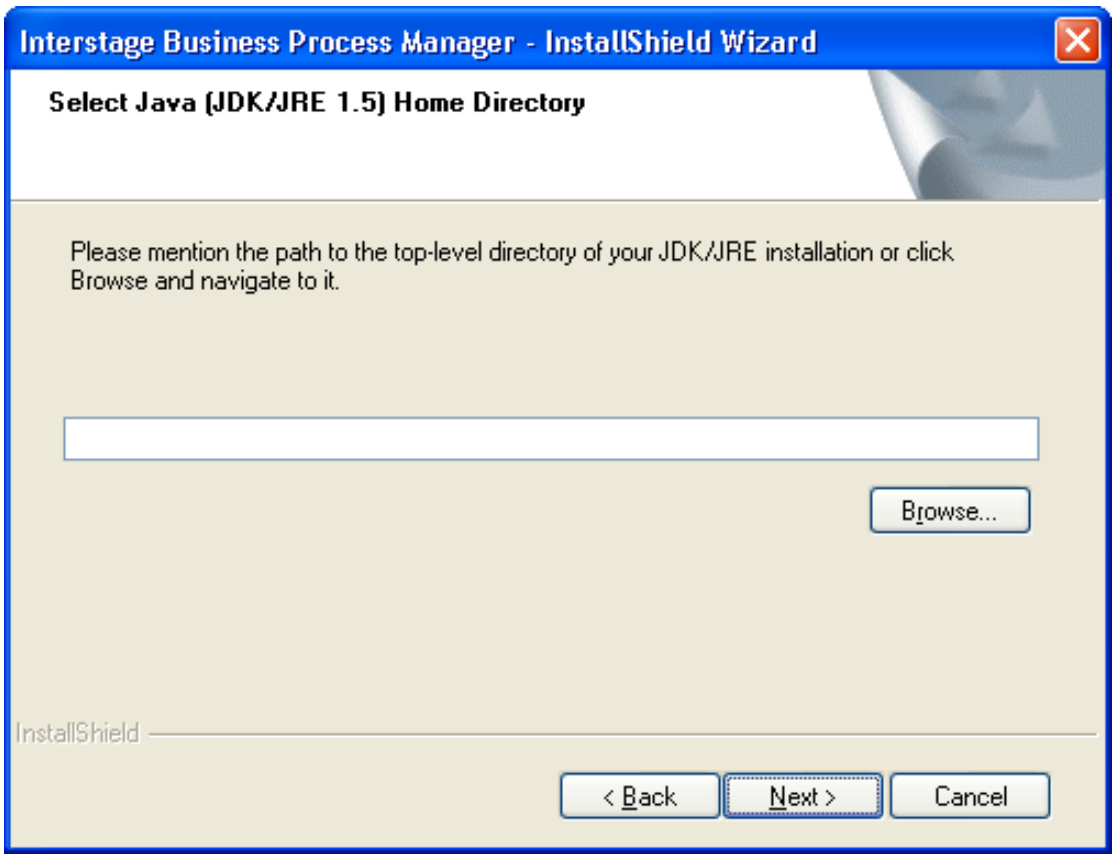
Interstage Business Process Manager - InstallShield Wizard
Select Java (JDK/JRE 1.5) Home Directory
Please mention the path to the top-level directory of your JDK/JRE installation or click Browse and navigate to it.
Browse...
InstallShield
< Back
Next >
Cancel

Figure 6: JDK/JRE Directory (for Windows)

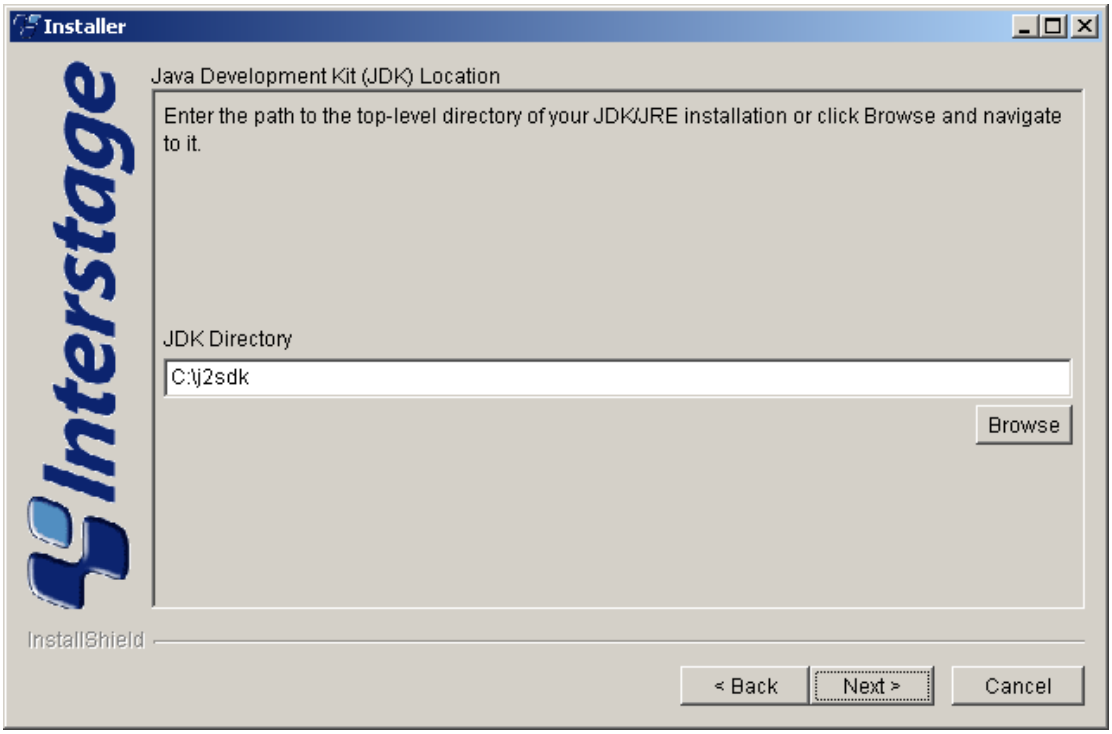

Figure 7: JDK/JRE Directory (for Solaris, Linux)

7. Click **Next**.
8. Make sure that the information displayed on the **Pre-Installation Summary** screen is correct.
9. Click **Next** to start the installation.

   The installation program starts copying files to your computer. Once the files have been copied, the **Start Deployment Tool** screen is displayed.
10. To launch the Deployment Tool, do one of the following:
    - **For Windows:** On the **Deployment Tool Option Screen** screen, if you want to proceed with the initial configuration, select **Launch Deployment Tool** check-box.

      A 64 bit-JVM-specific Deployment Tool and a 32 bit-JVM-specific Deployment Tool are provided for Windows Server 2003 and Windows Server 2008.

      1. Select the appropriate radio button to launch the 32 bit-specific or 64bit-specific Deployment Tool.

2. Click **Next**.

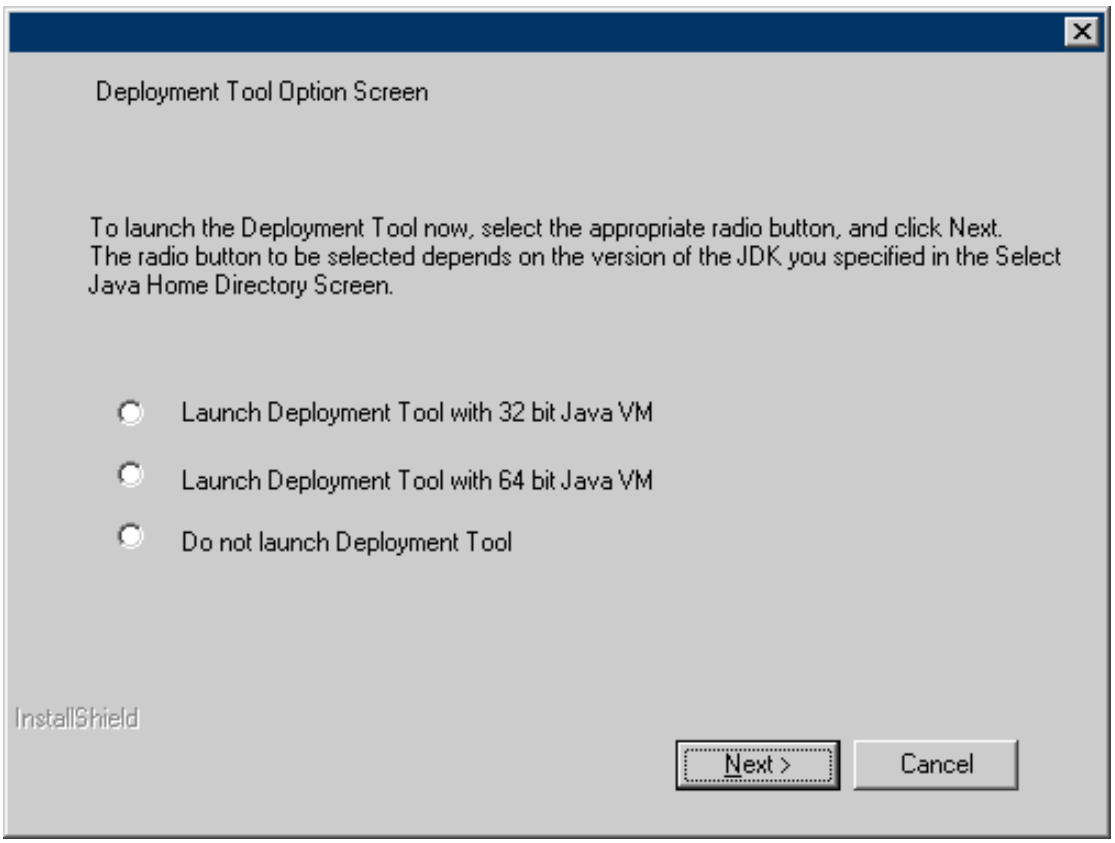
Deployment Tool Option Screen
To launch the Deployment Tool now, select the appropriate radio button, and click Next.
The radio button to be selected depends on the version of the JDK you specified in the Select Java Home Directory Screen.
Launch Deployment Tool with 32 bit Java VM
Launch Deployment Tool with 64 bit Java VM
Do not launch Deployment Tool
InstallShield
Next >
Cancel

Figure 8: Start Deplyment Tool - For Windows

- **For Solaris or Linux:** On the **Start Deployment Tool** screen, select the **Launch Deployment Tool** check box and click **Next**.

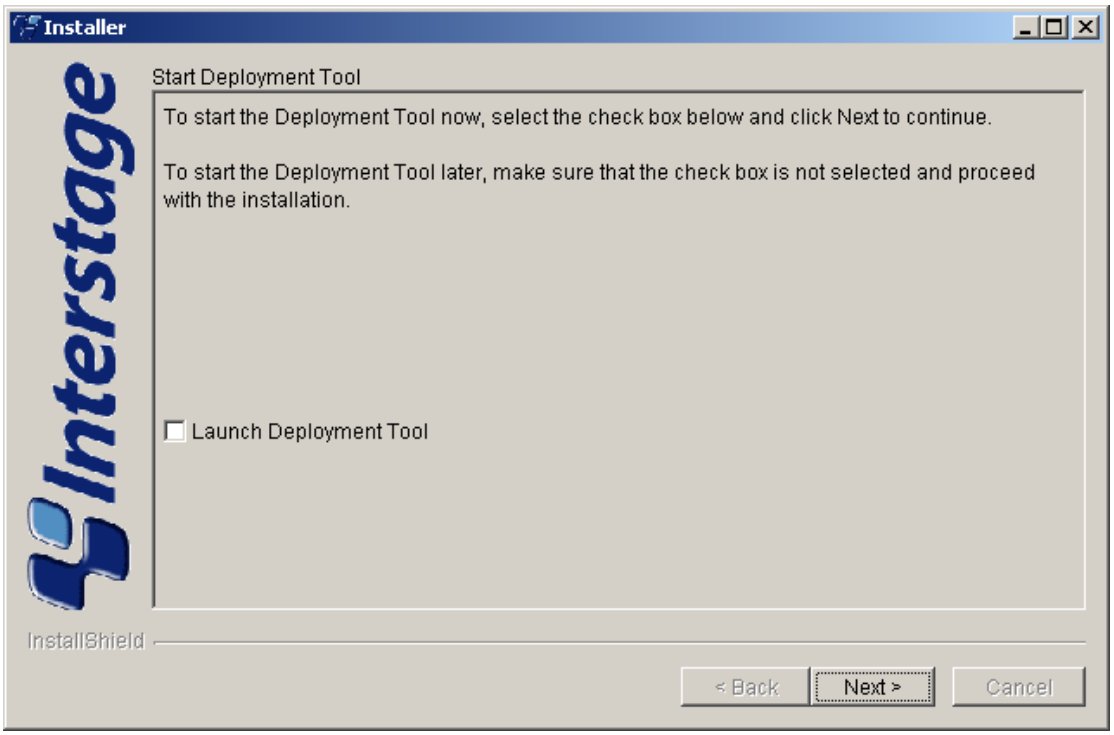
Installer
Start Deployment Tool
To start the Deployment Tool now, select the check box below and click Next to continue.
To start the Deployment Tool later, make sure that the check box is not selected and proceed with the installation.
Launch Deployment Tool
InstallShield
< Back
Next >
Cancel

Figure 9: Start Deployment Tool - For Solaris, Linux

If you want to configure and deploy Interstage BPM Server or Console at a later time, make sure that you select the **Do not launch Deployment Tool** radio button. Click **Next** and then **Finish**. Refer *Starting the Deployment Tool* on page 37 for more information about launching the Deployment Tool at a later time.

The installation program exits. If you selected to launch the Deployment Tool, the Deployment Tool is started.

6.5 Starting the Deployment Tool

Prerequisites:

- You have prepared the database server and the application server as explained in chapter *Preparing for Installation and Deployment of Interstage BPM Server and Console* on page 18.
- You have installed Interstage BPM.
- You have set the resolution of your screen and the font size as follows:

  On Solaris: 1024x768, Sans 9 pt font or 1280x1024, Sans 10 pt font

  On Linux: 1024x768, Sans 9 pt font or 1280x1024, Sans 10 pt font

  On Windows: 1024x768, system default font
- You have the required permissions for deployment. For details, refer to section *Permissions Required for Installation and Deployment* on page 29.

If you did not select the **Launch Deployment Tool** check box at the end of the installation process, you can start the Deployment Tool manually.

To start the Deployment Tool (for 32bit JVM):

- Run the startup script located in `<Interstage BPM Installation Directory>/server/deployment/tool`:

Operating System	Startup Script
Windows	`run_windows.bat`
Solaris	`run_solaris.sh`
Linux	`run_linux.sh`

  On Windows, you can also start the Deployment Tool using **Start** > **Programs** > **Interstage Business Process Manager** > **Launch Deployment Tool**.

Note: Do not use the 32bit-JVM-specific Deployment Tool if your Operating System is 64bit Windows and your Java Environment (JVM) is 64bit. Doing so will fail to launch the Deployment Tool. Instead, use the 64bit-JVM-specific Deployment Tool as detailed below.

64bit Deployment Tool for Windows

A new 64bit-JVM-specific Deployment Tool is provided for Windows Server 2003 and Windows Server 2008.

- Use the 64bit Deployment Tool only if both your Operating System as well as Java Environment (JVM) is 64bit. If used otherwise, the Deployment Tool will fail to start.
- When both Operating System and JVM is 64bit, do not launch the Deployment Tool through the final screen of the Installation Wizard (using the 'Launch Deployment Tool' checkbox). Doing so launches the 32bit Deployment Tool, causing a failure in the launch of the Deployment Tool.
- Irrespective of your Operating System, if your JVM is 32bit, use the 32bit Deployment Tool.
- 32bit Operating Systems and 64bit JVM are incompatible and using this combination will cause launch of Deployment Tool to fail irrespective of the version of Deployment Tool.

To start the 64bit-JVM-specific Deployment Tool do one of the following:

- Run the `run_windows_x64.bat` startup script located in `<Interstage BPM Installation Directory>/server/deployment/tool`
- On the Windows **Start** menu, navigate to **All Programs** > **Interstage Business Process Manager**, and click **Launch Deployment Tool (64 bit)**

6.6 Configuring the Remote Database

Prerequisite: You have prepared the database server as instructed in section *Database Server Preparation* on page 18.

This section describes how to run the Deployment Tool on the database server computer to configure the database. You will typically perform the instructions in this section only if your database is installed on a remote computer.

To configure the database:

1. If the Deployment Tool is not running, start it.

   For details, refer to section *Starting the Deployment Tool* on page 37.

2. On the **Welcome** screen of the Deployment Tool, select **Database Setup**.
3. Click **Next**.
4. On the **Database Selection** screen, select the database system you wish to use.
5. Click **Next**.
6. On the **Database Configuration** screen, enter the settings for your database.

   If you are using Oracle, refer to section *Oracle Settings* on page 47 for a detailed explanation.

   If you are using Microsoft SQL Server, refer to section *Microsoft SQL Server Settings* on page 44 for a detailed explanation.
7. Click **Next**.
8. Make sure that all the information displayed on the **Review Information** screen is correct.
9. Click **Finish** to start configuring the database.

   At the end of the process, a message is displayed notifying you that the database has been configured.
10. Click **OK** to exit the Deployment Tool.

6.7 Deploying Server Instances with Console, OR only Server Instances

Prerequisite: If you are using a remote database, you must have configured it as explained in section *Configuring the Remote Database* on page 38.

After you have started the Deployment Tool, you perform initial configuration steps before actually deploying the Interstage BPM Server with Console, or only the Server to an application server.

6.7.1 Operation Mode and Application Server Selection

1. On the **Welcome** screen of the Deployment Tool, select **Server/ Console Instance Setup** and click **Next**.

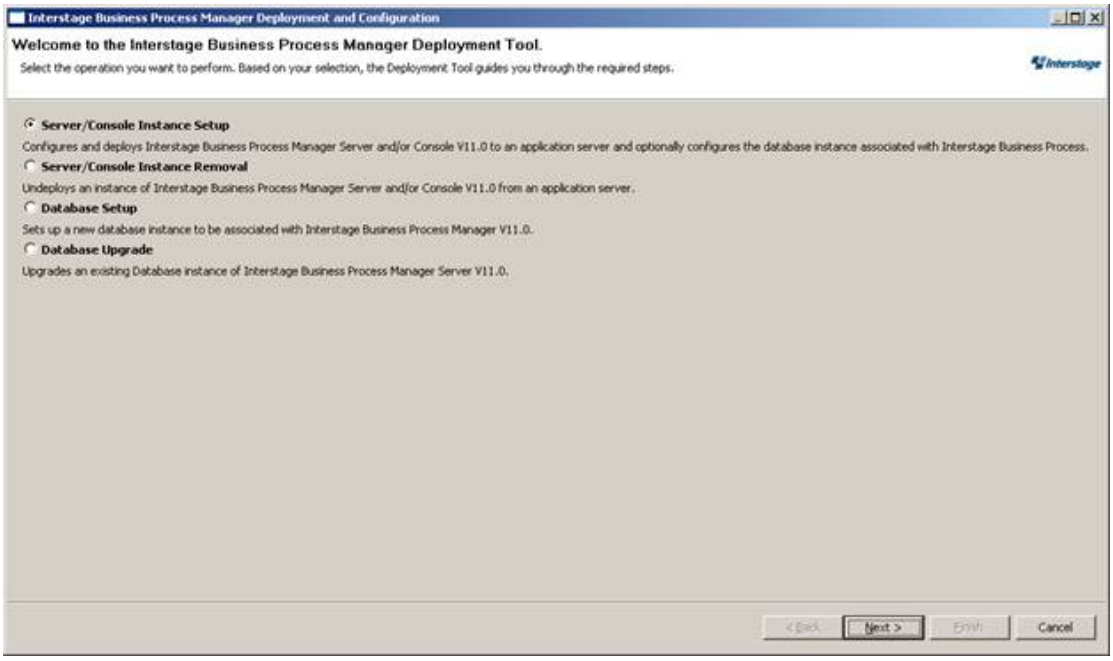
Interstage Business Process Manager Deployment and Configuration
Welcome to the Interstage Business Process Manager Deployment Tool.
Select the operation you want to perform. Based on your selection, the Deployment Tool guides you through the required steps.
Interstage
Server/Console Instance Setup
Configures and deploys Interstage Business Process Manager Server and/or Console V11.0 to an application server and optionally configures the database instance associated with Interstage Business Process.
Server/Console Instance Removal
Undeploys an instance of Interstage Business Process Manager Server and/or Console V11.0 from an application server.
Database Setup
Sets up a new database instance to be associated with Interstage Business Process Manager V11.0.
Database Upgrade
Upgrades an existing Database instance of Interstage Business Process Manager Server V11.0.
< Back
Next >
Finish
Cancel

Figure 10: Welcome

2. On the **Application Server Selection** screen:
   a) Select the type of application server on which you intend to deploy.
      In this case, select IBM WebSphere.
   b) Depending on your requirement, select the appropriate checkboxes (either, or both of **Interstage BPM Server**, **Interstage BPM Console**) for the Interstage BPM component you want to deploy.

Note: If you choose to deploy Interstage BPM Console, Interstage BPM Tenant Management Console is also automatically deployed.

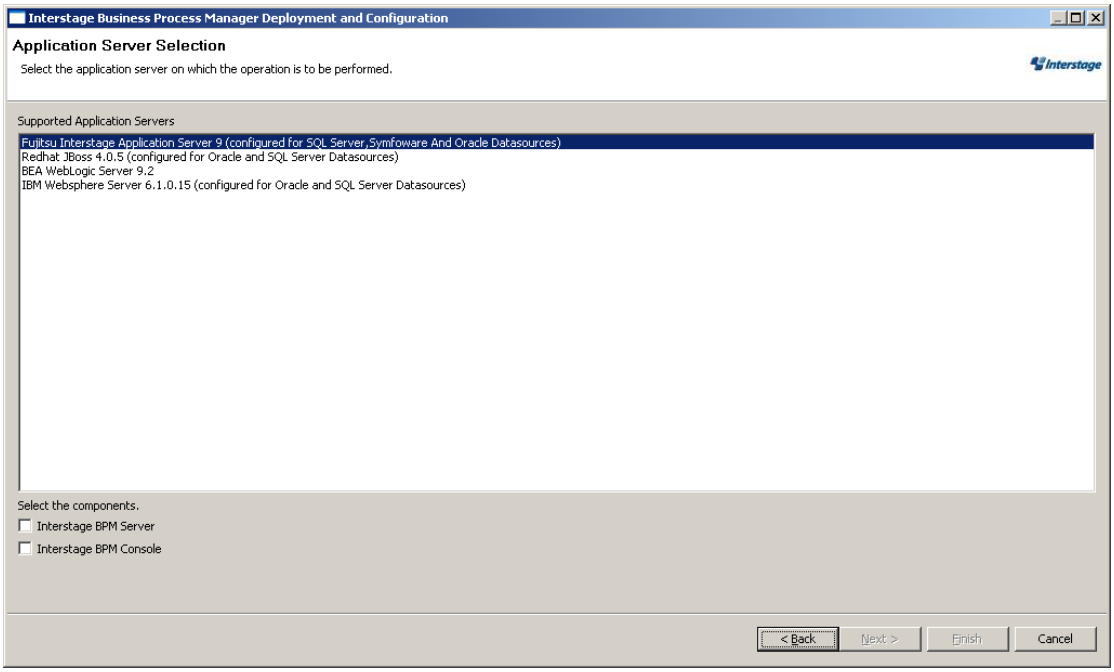
Interstage Business Process Manager Deployment and Configuration
Application Server Selection
Select the application server on which the operation is to be performed.
Interstage
Supported Application Servers
Fujitsu Interstage Application Server 9 (configured for SQL Server, Symfoware And Oracle Datasources)
Redhat JBoss 4.0.5 (configured for Oracle and SQL Server Datasources)
BEA WebLogic Server 9.2
IBM Websphere Server 6.1.0.15 (configured for Oracle and SQL Server Datasources)
Select the components.
Interstage BPM Server
Interstage BPM Console
< Back
Next >
Finish
Cancel

Figure 11: Application Server and Component selection sample screen

3. Click **Next**.

6.7.2 WebSphere Application Server Settings

Prerequisites:

- The application server is running.
- A WebSphere Application Server profile is available for use by Interstage BPM.

On the **WebSphere <Version> Application Server** screen, you provide the settings for your application server.

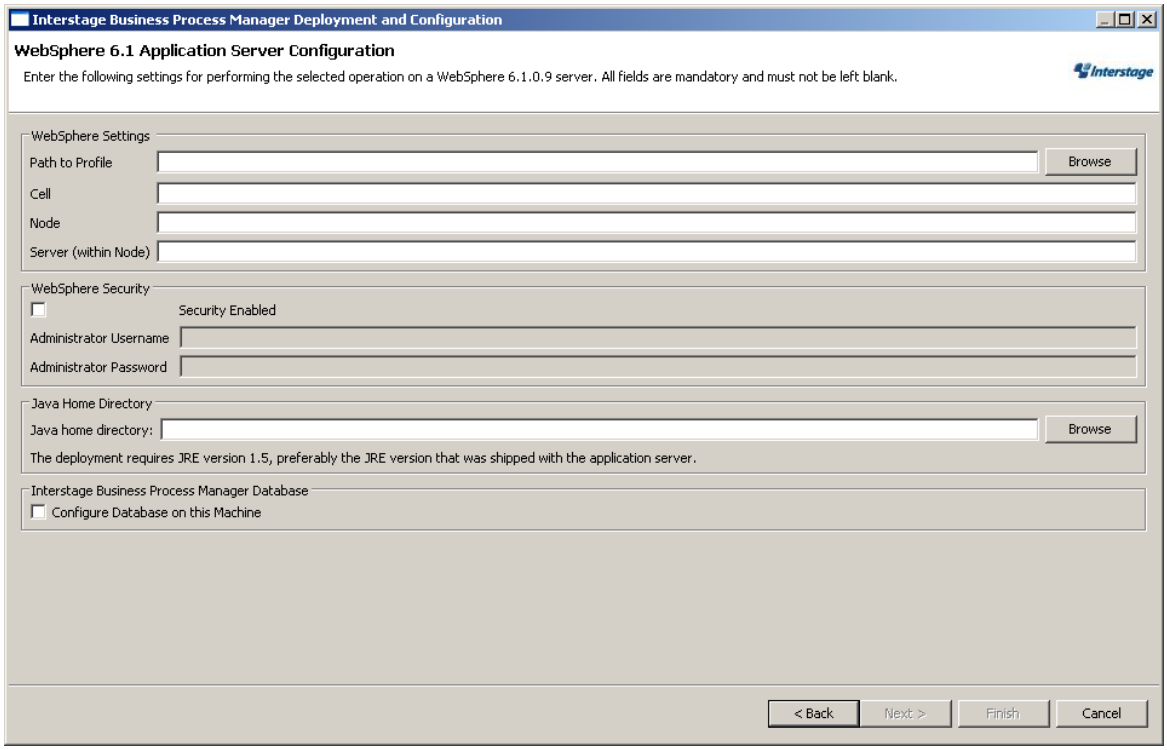
Interstage Business Process Manager Deployment and Configuration
WebSphere 6.1 Application Server Configuration
Enter the following settings for performing the selected operation on a WebSphere 6.1.0.9 server. All fields are mandatory and must not be left blank.
Interstage
WebSphere Settings
Path to Profile
Browse
Cell
Node
Server (within Node)
WebSphere Security
Security Enabled
Administrator Username
Administrator Password
Java Home Directory
Java home directory:
Browse
The deployment requires JRE version 1.5, preferably the JRE version that was shipped with the application server.
Interstage Business Process Manager Database
Configure Database on this Machine
< Back
Next >
Finish
Cancel

Figure 12: WebSphere Settings

1. In the **WebSphere Settings** area, enter the following information about the WebSphere Application Server profile you will be using for the Interstage BPM Server and Console:
   - **Path to Profile**: Enter the root directory of the WebSphere Application Server profile.

     Example for Windows: `C:\IBM\WebSphere\AppServer\profiles\AppSrv01`

     Example for Solaris: `/opt/IBM/WebSphere/AppServer/profiles/AppSrv01`

     Example for Linux: `/opt/IBM/WebSphere/AppServer/profiles/AppSrv01`
   - **Cell**: Enter the name of an **existing** WebSphere cell.

     The cell name corresponds to the name of a subdirectory in your WebSphere installation. To determine valid cell names, check the following directory:

     `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01/config/cells/`**`<CellName>`**

     Example: If you are deploying on a computer named `ibpmhost`, the cell name is typically `ibpmhostNode01Cell`.
   - **Node**: Enter the name of an **existing** WebSphere node.

     The node name corresponds to the name of a subdirectory in your WebSphere installation. To determine valid node names, check the following directory:

     `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01/config/cells/<CellName>/nodes/`**`<NodeName>`**

Example: If you are deploying on a computer named `ibpmhost`, the node name is typically `ibpmhostNode01`.

- **Server (within Node)**: Enter the name of an **existing** application server.

  The application server must be running within the node that you entered in the **Node** field. The server name corresponds to the name of a subdirectory in your WebSphere installation. To determine valid server names, check the following directory:

  `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01/config/cells/<CellName>/nodes/<NodeName>/servers/<ServerName>`

  Example: `server1`

Note: The Deployment Tool does not check whether the provided names (node name, cell name, server name) are correct. Make sure that you specify them correctly. As node names, cell names and server names are case-sensitive, make sure that the spelling is correct. You can verify the names using the "First steps" script located in `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01/firststeps`:

- On Windows: `firststeps.bat`
- On Solaris: `firststeps.sh`
- On Linux: `firststeps.sh`

2. If you enabled administrative security during WebSphere installation, do the following:
   a) Select **Security Enabled**.
   b) Enter the username and password of the administrator for your WebSphere Application Server.
3. In the **Java Runtime Environment** area, enter the top-level directory of your J2SE Development Kit (JDK) or Java Runtime Environment (JRE) installation.

   Example on Linux: `/usr/IBM/WebSphere/AppServer/java/jre`

Note:
- You are recommended to use the JDK or JRE that is shipped with the application server.
- The JDK or JRE installation path must not contain blanks.

4. If your database is running on the same computer as the application server, you can configure the database and deploy the server with a single run of the Deployment Tool. To do so, select **Configure Database on this Machine**.

Note: When selecting this option, make sure that you have the required permissions to configure the database. Otherwise, the deployment process will fail. For details, refer to section *Permissions Required for Installation and Deployment* on page 29.

If you do not have the required permissions, you may need to run the Deployment Tool twice: first to configure the database and then to deploy the server.

Note: If you are deploying only Interstage BPM Console, this database option will not appear on the application configuration screen.

5. Click **Next**.

6.7.3 Interstage BPM Console Settings

Prerequisites: You have selected to deploy Interstage BPM Console in the Deployment Tool's Application Server and Component Selection page (*Operation Mode and Application Server Selection* on page 40)

Console Settings:

On the **Console Configuration** page, you provide the settings for Interstage BPM Console. For details, refer section *Deploying Interstage BPM Console Using the Deployment Tool* on page 65.

6.7.4 Database Selection

1. On the **Database Selection** screen, select the database system you wish to use.

Note:	Refer to the Release Notes for the exact versions and editions of the supported database systems.

2. Click **Next**.

   The next appearing screen depends on the database system that you selected.

6.7.5 Microsoft SQL Server Settings

Prerequisite: You have prepared the database server as instructed in section *Database Server Preparation* on page 18.

On the **Database Configuration** screen, you provide the settings for the database you will be using with Interstage BPM. The items displayed on this screen depend on your selections regarding the database on previous screens.

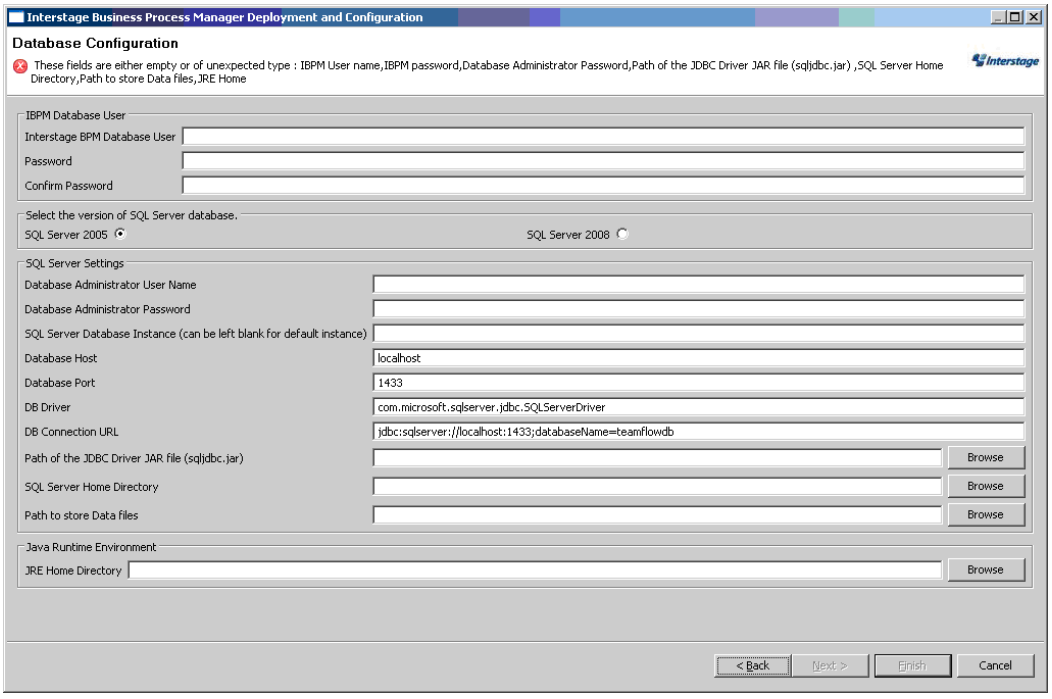
Interstage Business Process Manager Deployment and Configuration
Database Configuration
These fields are either empty or of unexpected type : IBPM User name,IBPM password,Database Administrator Password,Path of the JDBC Driver JAR file (sqljdbc.jar) ,SQL Server Home Directory,Path to store Data files,JRE Home
Interstage
IBPM Database User
Interstage BPM Database User
Password
Confirm Password
Select the version of SQL Server database.
SQL Server 2005
SQL Server 2008
SQL Server Settings
Database Administrator User Name
Database Administrator Password
SQL Server Database Instance (can be left blank for default instance)
Database Host
localhost
Database Port
1433
DB Driver
com.microsoft.sqlserver.jdbc.SQLServerDriver
DB Connection URL
jdbc:sqlserver://localhost:1433;databaseName=teamflowdb
Path of the JDBC Driver JAR file (sqljdbc.jar)
SQL Server Home Directory
Path to store Data files
Browse
Java Runtime Environment
JRE Home Directory
< Back
Next >
Finish
Cancel

Figure 13: Database Configuration

1. In the **Interstage Business Process Manager Database User** area, define the user name and password for a non-administrative database user account.

   An example of the user name is `ibpmuser`.

   Interstage BPM will use this account to log into the database.

Note: As a default, Microsoft SQL Server enforces a password policy that prevents users from using simple passwords. Make sure that you enter a password that meets the password policy requirements. Otherwise, the deployment will fail. For details on the password policy, refer to the Microsoft SQL Server documentation.

2. Select the version of your SQL Server database.
3. In the **SQL Server Settings** area, enter the following information:
   - **DB Driver**: This field is set by the Deployment tool. It is the full package name of the JDBC driver class used to create the database connection.

     If you are using the JDBC driver provided by Microsoft, the package name is:

     `com.microsoft.sqlserver.jdbc.SQLServerDriver`

     If you are using another JDBC driver than the one provided by Microsoft, refer to the driver documentation for information about the name of the driver class.
   - **DB Connection URL**: This field is set by the Deployment tool. This is the URL of the database to connect to. If you are using the JDBC driver provided by Microsoft, the database connection URL has the following format:

`jdbc:sqlserver://<Hostname>:<Database Port>;databaseName=teamflowdb`

Here `<Hostname>` is the name of the computer on which Microsoft SQL Server is installed. If this computer does not have a name use its IP address. If the database and the application server are running on different computers, make sure that you specify the actual hostname instead of `localhost`.

`<Database Port>` is the port number of the database server instance, typically 1433. For instructions on verifying the port number, refer to section *Configuring Microsoft® SQL Server* on page 18.

Example: `jdbc:sqlserver://localhost:1433;databaseName=teamflowdb`

Note: Do not change the name of the database.

If you are using another JDBC driver than the one provided by Microsoft, refer to the driver documentation for information about the database connection URL that you need to specify for that driver.

- **Path of the JDBC Driver JAR File (sqljdbc.jar)**: Specify the path of the JDBC driver `sqljdbc.jar` on the local computer.

  The Interstage BPM Server needs access to this driver to set up a connection to the database.

  For information about supported versions of the JDBC driver, refer to the *Release Notes*. For more information about the JDBC driver, refer to section *Configuring Microsoft® SQL Server* on page 18.

  Example: `C:\MicrosoftSQLServer2005JDBCDriver\sqljdbc_1.2\enu\sqljdbc.jar`

4. If you are configuring a database on the local computer, provide the following information:
   - **SQL Server Database Instance**: The default instance of Microsoft SQL Server is represented by a <blank>. If you are using a named instance of Microsoft SQL Server, enter the instance name.
   - **Database Host**: This field is set by the Deployment tool. It is the host name or IP address of the computer that hosts the Microsoft SQL Server instance you are using.
   - **Database Port**: This field is set by the Deployment tool. It is the port number of the Microsoft SQL Server instance you are using. If you are using the default instance, the port number is 1433.
   - **Database Administrator Password**: Enter the password for the Microsoft SQL Server Administrator user account.
   - **SQL Server Home Directory**: Specify the top-level directory of your Microsoft SQL Server installation, typically `C:\Program Files\Microsoft SQL Server`.
   - **Path to store Data files**: Specify a directory on a local disk in which the Interstage BPM database will reside, typically `C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Data`.

     The specified directory must already exist.
   - **JRE Home Directory**: Specify the top-level directory of your J2SE Development Kit (JDK) or Java Runtime Environment (JRE) installation.

     Example: `C:\Java\jdk5`

     For exact version information, refer to the *Release Notes*.

Note: The JDK or JRE installation path must not contain blanks.

5. Click **Next**.

6.7.6 Oracle Settings

Prerequisite: You have prepared the database server as instructed in section *Database Server Preparation* on page 18.

On the **Database Configuration** screen, you provide the settings for the database you will be using with Interstage BPM. The items displayed on this screen depend on your selections regarding the database on previous screens.

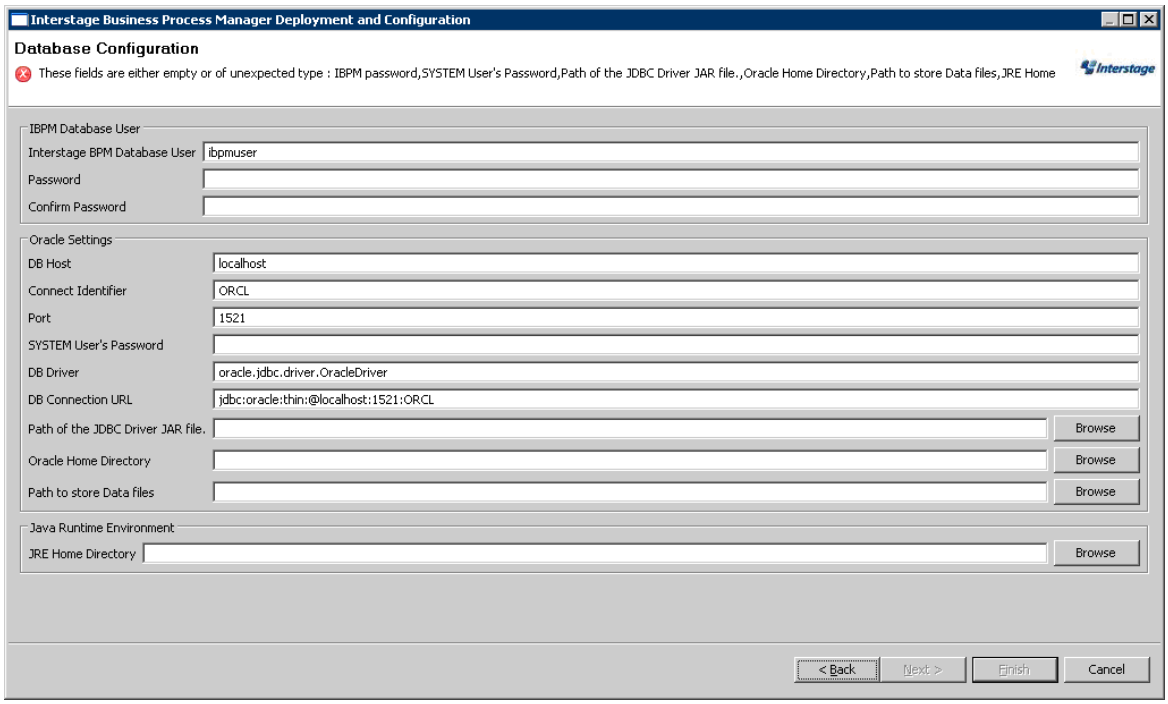

Figure 14: Database Configuration

1. In the **Interstage Business Process Manager Database User** area, define the user name and password for a non-administrative database user account.

   An example of the user name is `ibpmuser`.

   Interstage BPM will use this account to log into the database.

2. In the **Oracle Settings** area, enter the following information:
   - **DB Host**: This field is set by the Deployment tool. It is the name of the computer on which Oracle is installed.
   - **Connect Identifier**: This field is set by the Deployment tool. It is the connection identifier for the Oracle database that you are using. The connection identifier usually corresponds to the database name unless the database name is longer than eight characters. In this case, a trunkated version of the database name is used. You can verify the actual connection identifier in the `tnsnames.ora` file located in the `<ORACLE_HOME>/network/admin` directory.

- **Port**: This field is set by the Deployment tool. It is the Oracle port number, typically 1521. You can check the actual port number in the `targets.xml` file located in the `<ORACLE_HOME>/<hostname>_<SID>/sysman/emd` directory.
- **DB Driver**: This field is set by the Deployment tool. It is the full package name of the JDBC driver class used to create the database connection.

  If you are using the JDBC driver provided by Oracle, the package name is:

  `oracle.jdbc.driver.OracleDriver`

  If you are using another JDBC driver than the one provided by Oracle, refer to the driver documentation for information about the name of the driver class.
- **DB Connection URL**: This field is set by the Deployment tool. It is the URL of the database to connect to. If you are using the JDBC driver provided by Oracle, the database connection URL has the following format:

  `jdbc:oracle:thin:@<Hostname>:<Database Port>:<Database Name>`

  Here `<Hostname>` is the name of the computer on which Oracle is installed. If the database and the application server are running on different computers, make sure that you specify the actual hostname instead of `localhost`.

  `<Database Port>` is the Oracle port number, typically 1521.

  `<Database Name>` is exactly the same Oracle database name as specified when you created it.

  Example: `jdbc:oracle:thin:@localhost:1521:ORCL`

Note: You must specify `thin` as the protocol in the database connection URL.

  If you are using another JDBC driver than the one provided by Oracle, refer to the driver documentation for information about the database connection URL that you need to specify for that driver.
- **Path of the JDBC Driver JAR File**: Specify the path of the Oracle JDBC driver (`ojdbc14.jar` for Oracle 10g,`ojdbc5.jar` for Oracle 11g) on the local computer.

  Example on Windows: `C:\Oracle\Product\10.2.0\db_1\jdbc\lib\ojdbc14.jar`

  Example on Solaris: `/opt/oracle/product/10.2.0/db_1/jdbc/lib/ojdbc14.jar`

  Example on Linux: `/opt/oracle/product/10.2.0/db_1/jdbc/lib/ojdbc14.jar`

  The Interstage BPM Server needs access to this driver to set up a connection to the database.

3. If you are configuring a database on the local computer, provide the following information:
   - **SYSTEM User's Password**: Enter the password of the `SYSTEM` user.

     The `SYSTEM` user is one of the administrative user accounts maintained by Oracle.
   - **Oracle Home Directory**: Specify the top-level directory of your Oracle installation.

     Example on Windows: `C:\Oracle\Product\10.2.0\db_1`

     Example on Solaris: `/opt/oracle/product/10.2.0/db_1`

     Example on Linux: `/opt/oracle/product/10.2.0/db_1`
   - **Path to Store Data Files**: Specify a directory in which you want the Interstage BPM database to reside.

     Example on Windows: `C:\Oracle\Product\10.2.0\oradata\<Database Name>`

     Example on Solaris: `/u01/oradata/<Database Name>`

     Example on Linux: `/u01/oradata/<Database Name>`

Note: You must specify an existing directory and have write permissions for the specified directory.

- **JRE Home Directory**: Specify the top-level directory of your J2SE Development Kit (JDK) or Java Runtime Environment (JRE) installation.

  For exact version information, refer to the *Release Notes*.

  Example on Windows: `C:\j2sdk1.5`

  Example on Solaris: `/usr/java/j2sdk1.5`

  Example on Linux: `/usr/java/j2sdk1.5`

Note: The JDK or JRE installation path must not contain blanks.

4. Click **Next**.

6.7.7 Super User and Multitenancy Settings

On the **InterstageBPM Super User Page**, you set your Super User name and password, as well as multitenancy settings.

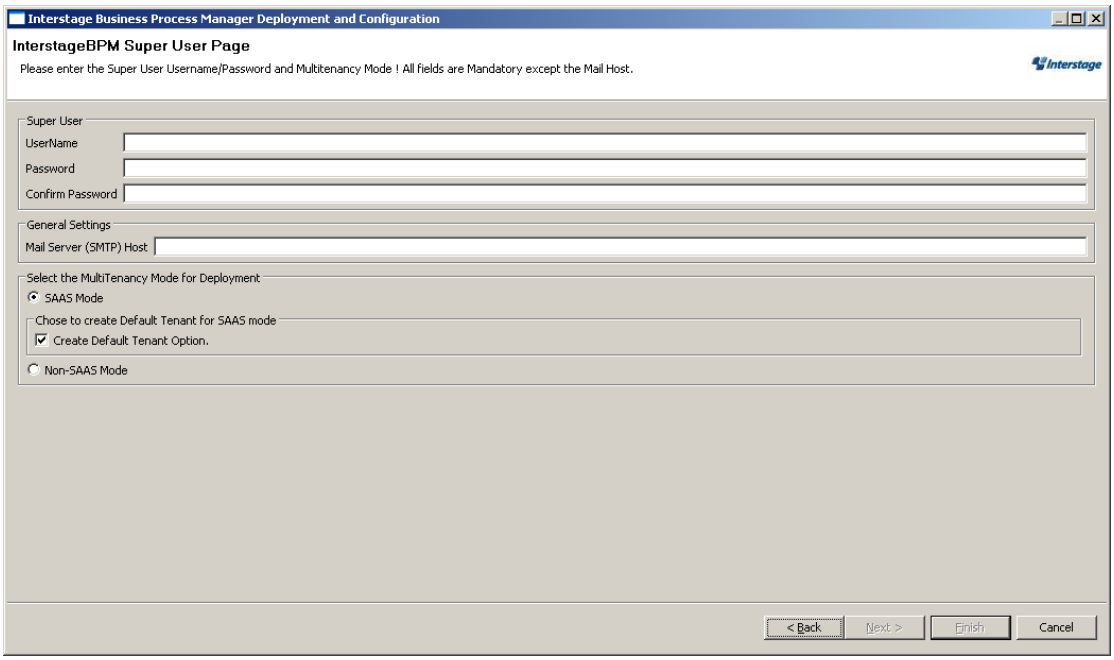

Figure 15: Super User and Mulititenancy Settings

1. Set the username and password for the Super User. Also confirm the password.
2. In the **General Settings** section, optionally update the Mail Server that will be used to send email notifications.
3. In the Multitenancy Settings section, choose from the following options:
   a) Select **SAAS Mode** if you intend to use Interstage BPM in the SaaS (Software as a Service) mode, and also choose whether you want to create a default tenant or not.

   If you select the SaaS mode, you will be set up as a Super User, and be allowed to create multiple tenant users to whom you can provide the Interstage BPM as a software service over

a network. However, your functionality will be limited to only managing tenants and the Interstage BPM Server; if you also need to use Interstage BPM just as a tenant would, and also work with the default **System** application, you can choose to set up a default tenant.

b) Select **Non-SAAS Mode** if you intend to use Interstage BPM in the non-SAAS mode.

Note: Ensure you select **Non-SAAS Mode** if you are upgrading from previous versions of Interstage BPM.

In the non-SaaS mode, the default tenant, tenant owner, with the default **System** application will be set up; you will not be allowed to create any further tenants nor provide Interstage BPM as a software service. All Interstage BPM functionality will be accessible only through this default tenant.

For more information about Interstage BPM's SaaS feature, refer the *Interstage Business Process Manager Developer's Guide*.

Note: The default tenant that is set up is named `Default`.

4. Click **Next**.

6.7.8 User and Group Management

The **Directory Server Selection** screen appears only if you have selected the SaaS mode **with** the option to create a default tenant, or the non-SaaS mode. In this screen you select the system to be used for managing users and groups and you define the Interstage BPM default tenant account.

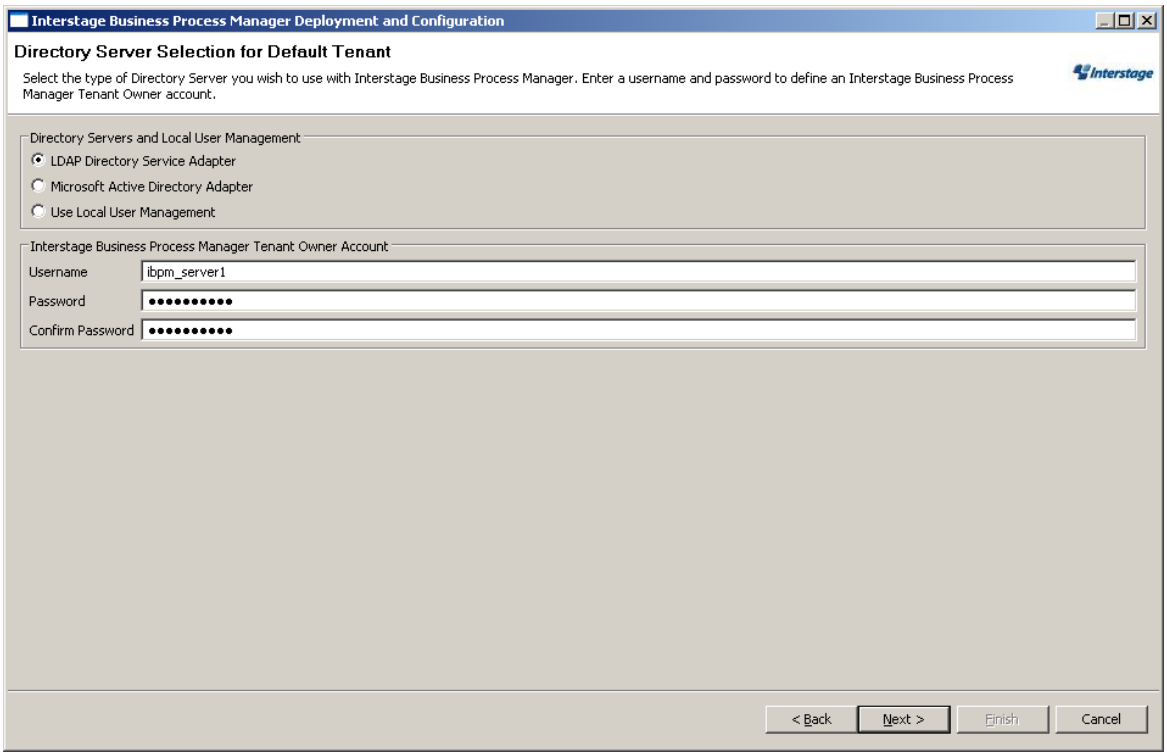
Interstage Business Process Manager Deployment and Configuration
Directory Server Selection for Default Tenant
Select the type of Directory Server you wish to use with Interstage Business Process Manager. Enter a username and password to define an Interstage Business Process Manager Tenant Owner account.
Interstage
Directory Servers and Local User Management
LDAP Directory Service Adapter
Microsoft Active Directory Adapter
Use Local User Management
Interstage Business Process Manager Tenant Owner Account
Username
ibpm_server1
Password
Confirm Password
< Back
Next >
Finish
Cancel

Figure 16: Directory Service Selection and Authentication

1. In the **Directory Servers and Local User Management** area, select one of the following options:
   - LDAP Directory Service Adapter
   - Microsoft Active Directory Adapter
   - Use Local User Management

Note: If you use Sun Java System Directory Server as your Directory Service, select **LDAP Directory Service Adapter**.

2. In the **Interstage Business Process Manager Tenant Owner Account** area, enter a user name and password for the tenant owner. The tenant owner role is the administrator for the default tenant account.

   If you selected a Directory Service, by default, the user account defined on this screen is also used to log into the Directory Service. You can also use a different user. To do so, you must change the `LDAPAccessUserID` and `LDAPAccessUserPassword` configuration parameters of the Interstage BPM Server. Refer to the *Interstage Business Process Manager Server Administration Guide* for more information.

3. Click **Next**.

The screen appearing next depends on the type of Directory Service you selected.

6.7.9 Sun Java System Directory Settings

On the **LDAP Configuration** screen, you provide the settings for Sun Java System Directory.

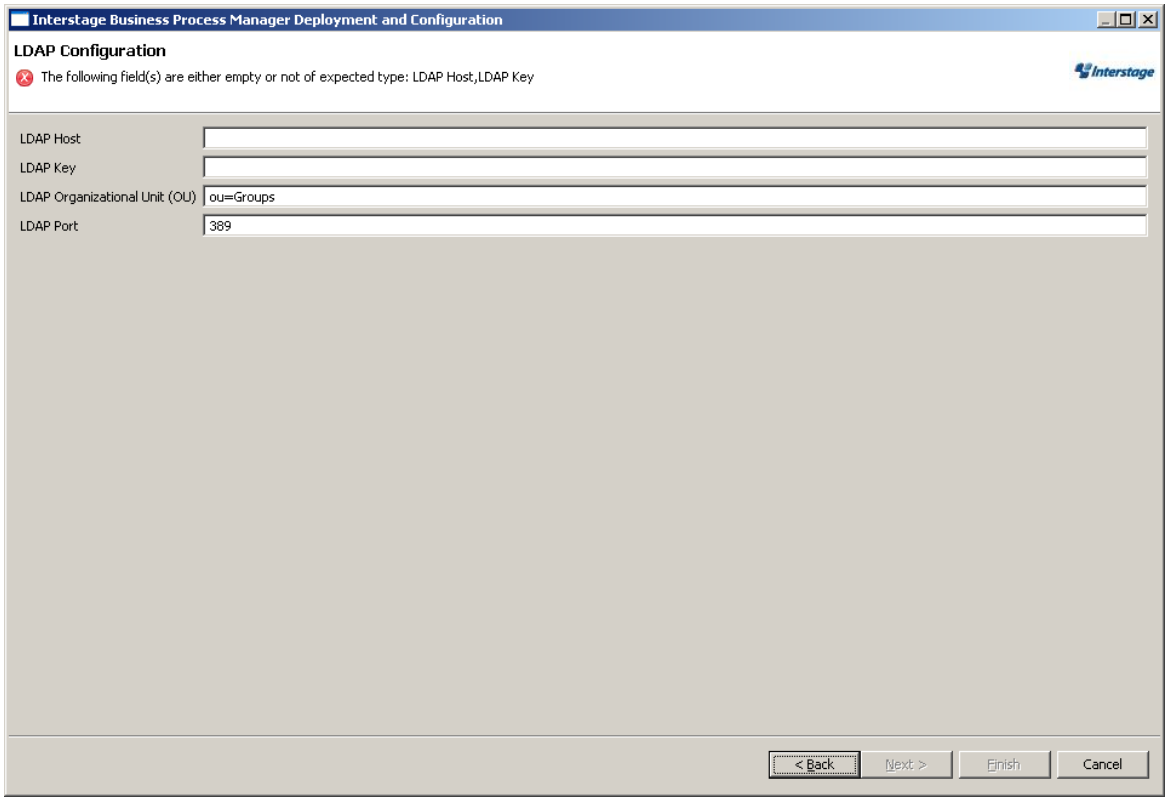

Figure 17: LDAP Settings

1. Enter the following information:
   - **LDAP Host**: Enter the name of the computer on which your LDAP server is running.
   - **LDAP Key**: Enter the directory sub-tree where groups and users to be used with Interstage BPM are stored.
   - **LDAP Organizational Unit (OU)**: Enter the organizational unit where groups to be used with Interstage BPM are stored.

     Example: `ou=Groups`.
   - **LDAP Port**: Enter the port number of your LDAP server. The port number is typically 389.

   After deployment, you need to configure your Directory Service for Interstage BPM. Refer to section *Setting Up Sun Java System Directory Server* on page 92 for more information.
2. Click **Next**.

6.7.10 Active Directory Settings

On the **Active Directory Configuration** screen, you provide the settings for Microsoft Active Directory.

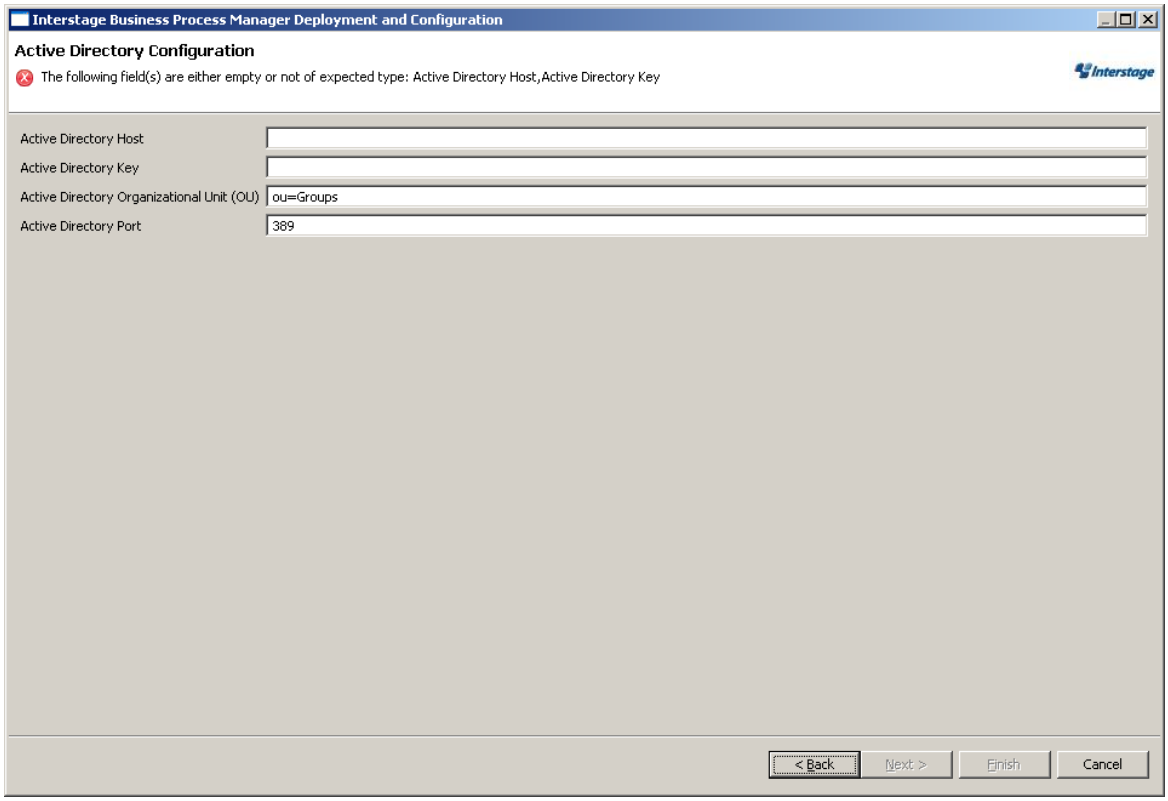

Figure 18: Active Directory Settings

1. Enter the following information:
   - **Active Directory Host**: Enter the name of the computer on which your Active Directory server is running.
   - **Active Directory Key**: Enter the directory sub-tree where groups and users to be used with Interstage BPM are stored.
   - **Active Directory Organizational Unit (OU)**: Enter the organizational unit where groups to be used with Interstage BPM are stored.
   - **Active Directory Port**: Enter the port number of your Active Directory server.

   After deployment, you need to configure your Directory Service for Interstage BPM. Refer to section *Setting Up Microsoft® Active Directory* on page 82 for more information.
2. Click **Next**.

6.7.11 Other Settings

On the **Other Settings for Default Tenant** screen, you specify settings for the following external systems. Specifying these settings is optional.

- Interstage BPM Analytics

Interstage BPM Analytics can be used for analyzing and evaluating the process data from the Interstage BPM Server.

- WebDAV Repository

  Interstage BPM can be integrated with any WebDAV-compliant repository in order to publish metadata for process definitions to that repository. The examples used below are for CentraSite. If you do not know the settings for your particular WebDAV repository, refer to the instructions for using your WebDAV repository software.

- UDDI Registry

  Interstage BPM can be integrated with any UDDI-compliant registry in order to publish process definition information and search for Web Services. The examples used below are for CentraSite. If you do not know the settings for your particular UDDI registry, refer to the instructions for using your UDDI registry software.

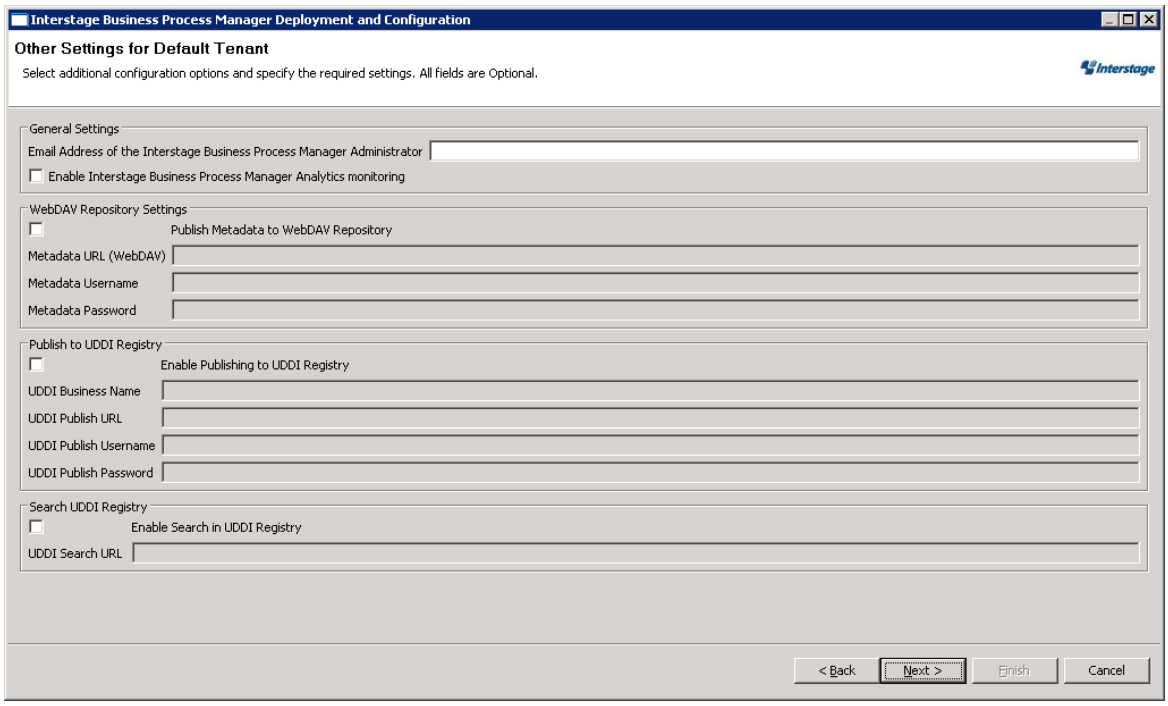
Interstage Business Process Manager Deployment and Configuration
Other Settings for Default Tenant
Select additional configuration options and specify the required settings. All fields are Optional.
Interstage
General Settings
Email Address of the Interstage Business Process Manager Administrator
Enable Interstage Business Process Manager Analytics monitoring
WebDAV Repository Settings
Publish Metadata to WebDAV Repository
Metadata URL (WebDAV)
Metadata Username
Metadata Password
Publish to UDDI Registry
Enable Publishing to UDDI Registry
UDDI Business Name
UDDI Publish URL
UDDI Publish Username
UDDI Publish Password
Search UDDI Registry
Enable Search in UDDI Registry
UDDI Search URL
< Back
Next >
Finish
Cancel

Figure 19: Other Settings

1. In the **General Settings** area, enter the following information:
   - **Email Address of the Interstage Business Process Manager Administrator**: Specify the email address (or alias email address) of the Interstage BPM Tenant Owner.

     This address will appear in the `From:` field on all email messages sent from the Interstage BPM Server. This includes all email notifications, work item escalations, timer resolution messages, etc.

   - **Enable Interstage Business Process Manager Analytics monitoring**: Select this option if you want to use Interstage BPM Analytics for analyzing and evaluating process data.

     Additional configuration steps must be performed to set up the Interstage BPM Analytics Sensor. Refer to the *Interstage BPM Analytics documentation* for more information.

2. If you want to publish metadata for process definitions to a metadata repository, in the **WebDAV Repository Settings** area, select **Publish Metadata to WebDAV Repository** and enter the following information:
   - **Metadata URL (WebDAV)**: Enter the URL to which metadata will be published when an Interstage BPM process definition is published. For CentraSite use the following URL:

     `http://<hostname>:53305/CentraSite/CentraSite/ino:dav/ino:dav/projects`
   - **Metadata Username**: Enter the name of the user used for publishing metadata. This user must be a CentraSite Administrator.

     On Windows: Specify a fully-qualified user name, i.e. user name including the domain name: `<DOMAIN NAME>\\<user name>`. Specify the domain name in capital letters. If you specify a local user, use the hostname as a domain name, e.g. `MYLOCALHOST\\myusername`.
   - **Metadata Password**: Enter the password of the user used for publishing metadata.
3. If you want to publish process definitions to a UDDI registry, select **Enable Publishing to UDDI Registry** and enter the following information:
   - **UDDI Business Name**: Name of the organization that is publishing process definition information to the UDDI registry. It is an identifier that helps you to categorize the process definition information added to the UDDI registry and makes it easier to search and retrieve the process definition Web Services.

     For CentraSite, use your company name. Make sure that the company name specified is registered as an organization in CentraSite.
   - **UDDI Publish URL**: URL to which UDDI registry information will be published when an Interstage BPM process definition is published. For CentraSite use the following URL:

     `http://<hostname>:53307/UddiRegistry/publish`
   - **UDDI Publish Username**: Name of the user used for publishing UDDI registry information. This user must be a CentraSite Administrator. Also, the user must have rights to publish data to the organization specified in **UDDI Business Name**. For CentraSite, specify the name of the user who registered the UDDI Business Name as an organization in CentraSite.

     On Windows: Specify a fully-qualified user name, i.e. user name including the domain name: `<DOMAIN NAME>\\<user name>`. Specify the domain name in capital letters. If you specify a local user, use the hostname as a domain name, e.g. `MYLOCALHOST\\myusername`.
   - **UDDI Publish Password**: Password of the user used for publishing UDDI registry information.
4. If you want to search a UDDI registry, select **Enable search in UDDI Registry** and enter the UDDI search location.

   This option allows you to search the UDDI registry using a dialog that is part of the Process Designer tool in the Interstage BPM Console. For CentraSite, use the following URL:

   `http://<hostname>:53307/UddiRegistry/inquiry`
5. Click **Next**.

6.7.12 Starting the Deployment

The **Review Information** screen summarizes the selected operations.

1. Make sure that all the information displayed on the **Review Information** screen is correct.
2. If you want to generate a script that can be used for silent deployment of the Interstage BPM Server, select **Generate properties file for silent operation mode**.

A silent mode deployment is a non-interactive type of deployment, which may save a significant amount of time. You may want to consider using the silent mode deployment if you have to perform multiple deployments of the Interstage BPM Server and the configurations are essentially the same. For further information, refer to appendix *Silent Mode Deployment* on page 108.

Note: Plain text passwords will be written to the properties file. As this may pose a security problem, make sure that you protect the properties file from being accessed by unauthorized users.

3. Click **Finish** to start deploying the Interstage BPM Server to the application server.

   At the end of the deployment process, a message is displayed notifying you that the server has been deployed.

4. Click **OK** to exit the Deployment Tool.

The Deployment Tool created a configuration file named `ibpm.properties` in `<Interstage BPM Server Installation Directory>/server/instance/default`. This file reflects the server configuration parameters that have been written to the database during deployment. You can use the `ibpm.properties` file as a reference of your initial configuration settings. If you need to change the configuration, you can use the Configuration Tool or the configuration scripts provided by Interstage BPM. For details, refer to the *Interstage Business Process Manager Server Administration Guide*.

6.8 Password Protection

Passwords set during deployment are written to several files. Exposing these passwords may pose a security problem. Fujitsu recommends that you implement suitable security measures over these files to ensure that the passwords are inaccessible to those users who should not have access to them.

- From `<Interstage BPM Server Installation Directory>/server/deployment/sql`, secure the database scripts.
- From `<Interstage BPM Server Installation Directory>/client/samples/configuration`, secure
  - `createADUser.bat`
  - `IBPMLDAPAdd.ldif`
  - `importAD.bat`

6.9 User Accounts and Groups

Every user that is to work with Interstage BPM needs a user account and must be assigned to one or more groups.

A group is a collection of users who share a function within an organization. For example, a `Manager` group might contain the first-line managers in an organization. Any Interstage BPM user may be made a member of any group.

In Interstage BPM, groups are used to determine who is responsible for carrying out a task in a process. Activities in process definitions are assigned to so-called Roles, which are equivalent to groups. The advantage of assigning activities to Roles (rather than individuals) is that if personnel changes occur, only the Role definition needs to be updated, and not all the processes that use the Role.

To set up an Interstage BPM user account, you create an account with appropriate user rights. You must make sure that the user names for the Interstage BPM users and the group members are identical.

Note: To create user accounts and groups that are valid for Interstage BPM, use only alphanumeric characters, hyphens, and underscore characters ("_"). User names and group names must not begin with an at character ("@") as this is used to identify Agents in Interstage BPM.

The default group used by Interstage BPM is `Role`. Interstage BPM administrator accounts must be members of a special group named by default `AdminRole`.

If you have configured the Interstage BPM Server to use a Directory Service, you need to configure the Directory Service before starting the Interstage BPM Server. The Interstage BPM Deployment Tool has created an Interstage BPM LDIF file, which contains default users, default groups and the default Interstage BPM object class for the Directory Service. You can import the LDIF file into your Directory Service in order to configure it. For details, refer to chapter *Setting Up a Directory Service* on page 82.

If you have configured the Interstage BPM Server to use its local user store, the Interstage BPM Super User account has already been created in the user store. There is no need to perform further configuration steps before starting the Interstage BPM Server. For details on creating additional user accounts and groups, refer to the *Interstage Business Process Manager User's Guide*.

6.10 Switching on Java Security

This section is applicable for SaaS mode only.

In the SaaS mode, it is critical that each tenant has access to only their own resources, and no other tenant's resources. To achieve this security, you need to manually switch on Java security as follows:

For WebSphere Application Server:

1. In the WebSphere Administration Console, navigate to **Security** > **Secure administration, applications, and infrastructure**
2. In the **Java 2 Security** section, ensure all checkboxes are selected.
3. To the `app.policy` file located in the `<WebSphere Installation Directory>/config/cells/<cell_name>/nodes/<node_name>/` directory, add the following:

```
grant {
        permission java.security.AllPermission;
      };
```

4. Add the following permission to the `policy.xml` file. Refer the *Interstage BPM Administration Guide* for details about its location and how to edit this file.

```
...
  <permission
   className="java.lang.RuntimePermission"
   target="modifyThread"/>
  ...
```

5. Additionally, in case the Server will output anything to the `SystemOut.log` and `SystemErr.log` files, add the following permissions for these files to `policy.xml`.

```
...
  <permission
   className="java.io.FilePermission"
   target=<Path of SystemOut.log>
   action="read,write"/>
  <permission
   className="java.io.FilePermission"
   target=<Path of SystemErr.log>
   action="read,write"/>
  ...
```

Additional Settings for Custom Adaptors

In case you intend to use Custom Directory Adapters to connect to remote server, you need to add the following permission in the `policy.xml` file. Refer the *Interstage BPM Administration Guide* for details about its location and how to edit this file.

```
...
  <permission
   className="java.net.SocketPermission"
   target="*"
   action="connect,resolve"/>
  ...
```

6.11 Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server

Prerequisite:

- If you are using a Directory Service, you must have configured that Directory Service for Interstage BPM. For details, refer to chapter *Setting Up a Directory Service* on page 82.
- If you opted for SaaS mode during Server deployment, you have switched on Java security. For details, refer *Switching on Java Security* on page 57.

To configure Interstage BMP for WebSphere Application Server, and to start WebSphere Application Server and Interstage BPM Server:

1. Perform this step if the following applies:
   - You are using WebSphere Application Server Network Deployment (ND) Edition.
   - You have installed the Deployment Manager profile.
   - You have added an application server node to the Deployment Manager's cell.

   Change the Interstage BPM configuration as follows:

   a) In the WebSphere Administrative Console, go to **Servers** > **Application Servers** > **<Server Name>** > **Ports**. Note down the port number of the `BOOTSTRAP_ADDRESS` port.

   b) In the Interstage BPM configuration files that are listed below, find the `NamingProviderURL` and `JmsNamingProviderURL` parameters and add the `BOOTSTRAP_ADDRESS` port:

```
NamingProviderUrl=iiop://<HOSTNAME>:<BootstrapPort>
JmsNamingProviderUrl=iiop://<HOSTNAME>:<BootstrapPort>
```

These are the configuration files that you need to check:

Configuration File	Location
ibpm.properties	<Interstage BPM Server Installation Directory>/server/instance/default
iFlowClient.properties	<Interstage BPM Server Installation Directory>/client

2. In the WebSphere Administrative Console, go to **Servers** > **Application Servers** > **<Server Name>** > **Configuration** > **General Properties** > **Server-specific Application Settings**. Ensure **Classloader policy** is set to `Multiple`.

   This step is required to make Interstage BPM Console work correctly.

3. This step is required only if you use Oracle 11g as a local or remote database. In the WebSphere Administrative Console, go to **Resources** > **JDBC** > **JDBC Providers** > **iFlowJDBCProvider** > **General Properties**. In the **Class path** change the name of the JAR file from `ojdbc14.jar` to **`ojdbc5.jar`**.
4. This step is required only if the WebSphere administrative security is on. When WebSphere administrative security is on, it causes Bus security to be on, which in turn causes IBPM to function incorrectly. Use the following steps to switch off Bus security:
   a) Log on to the WebSphere admin console, and navigate to **Service Integration** > **Buses**.
   b) On the **Buses** page, in the IBPM bus row, click the **Enabled** link.
   c) On the **Configuration** tab, under the **Security** section, uncheck the **Enable bus security** checkbox.
   d) Click **OK**, and in the **Messages** section at the top of the page, click the **Save** link.
   e) Log off from the WebSphere admin console.
5. Stop and restart the WebSphere Application Server.

   This step is required so that configuration changes made during Interstage BPM installation and any subsequent changes take effect.

   a) To stop the application server, run the shutdown script located in `<WebSphere-Install-dir>\AppServer\profiles\AppSrv01\bin`:

Operating System	Shutdown Script
Windows	`stopServer.bat <Server Name>` Example: `stopServer.bat server1` **Note:** If your WebSphere administrative security is enabled, use this script: `stopServer.bat <ServerName> -user <Admin UserName> -password <Admin password>` Example: `stopServer.bat server1 -user Abc -password Abc123`

Operating System	Shutdown Script
Solaris Linux	`stopServer.sh <Server Name>` Example: `stopServer.sh server1` **Note:** If your WebSphere administrative security is enabled, use this script: `stopServer.sh <ServerName> -user <Admin UserName> -password <Admin password>` Example: `stopServer.sh server1 -user Abc -password Abc123`

On Windows, you can also stop the application server using the following menu path:

WebSphere Edition	Menu Path
WebSphere Application Server Base Edition	**Start** > **Programs** > **IBM WebSphere** > **Application Server Base V6.1** > **Profiles** > **AppSrv01** > **Stop the server**
WebSphere Application Server Network Deployment (ND) Edition	**Start** > **Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Stop the server**

b) To start the application server, run the startup script located in `<WebSphere-Install-dir>\AppServer\profiles\AppSrv01\bin`:

Operating System	Startup Script
Windows	`startServer.bat <Server Name>` **Note:** If your WebSphere administrative security is enabled, use this script: `startServer.bat <ServerName> -user <Admin UserName> -password <Admin password>`
Solaris Linux	`startServer.sh <Server Name>` **Note:** If your WebSphere administrative security is enabled, use this script: `startServer.sh <ServerName> -user <Admin UserName> -password <Admin password>`

On Windows, you can also start the application server using the following menu path:

WebSphere Edition	Menu Path
WebSphere Application Server Base Edition	**Start** > **Programs** > **IBM WebSphere** > **Application Server Base V6.1** > **Profiles** > **AppSrv01** > **Start the server**
WebSphere Application Server Network Deployment (ND) Edition	**Start** > **Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Start the server**

If everything has been installed correctly, your WebSphere Application Server starts. **The Interstage BPM Server also starts.**

Interstage BPM for WebSphere is now ready to use.

Note: If you want to change the hostname of the computer where WebSphere Application Server and Interstage BPM have been installed, you can do so. However, make sure that you replace the old hostname in directory names under the WebSphere installation directory.

For example, if you change the hostname from `ibpmhost` to `testhost`, you must rename directories like `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01/config/cells/ibpmhostNode01Cell` to `<WebSphere Installation Directory>/AppServer/profiles/AppSrv01/config/cells/testhostNode01Cell`.

6.12 Starting Interstage BPM Console and Tenant Management Console

Prerequisites:

The application server where you have deployed Console is running.

To start Interstage BPM Console or Tenant Management Console:

1. Ensure Interstage BPM Server is started. Refer section *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58
2. Login to the WebSphere Administration Console.
3. Select **Applications**>**Enterprise Applications**.

   A list of Enterprise Applications appears.
4. Click the **InterstageBPMConsole** link.

   The configuration page for the application appears.

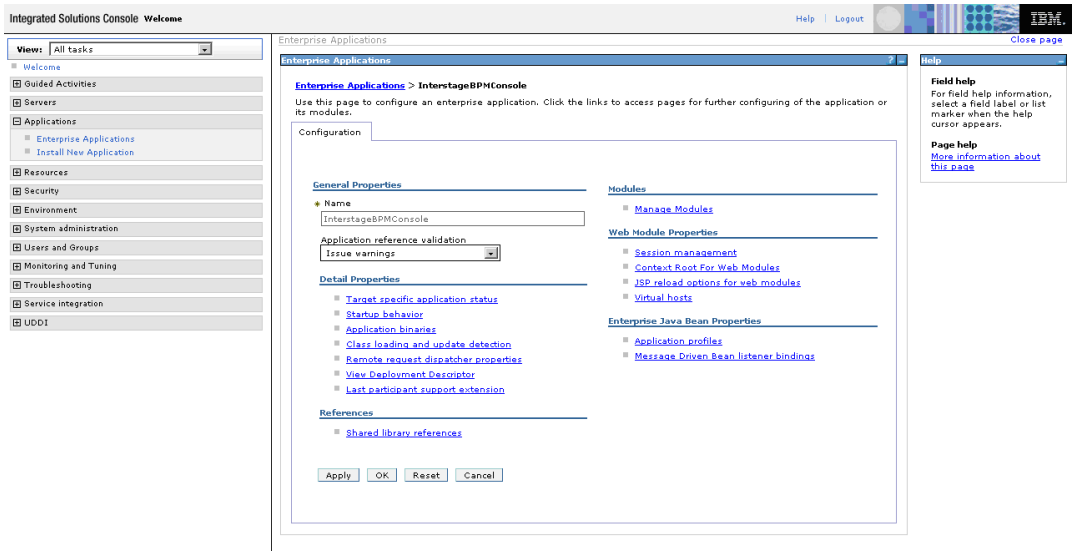

Figure 20: Enterprise Application Configuration Page

5. Select the **Class loading and update detection** link.
   The class loader details page appears.

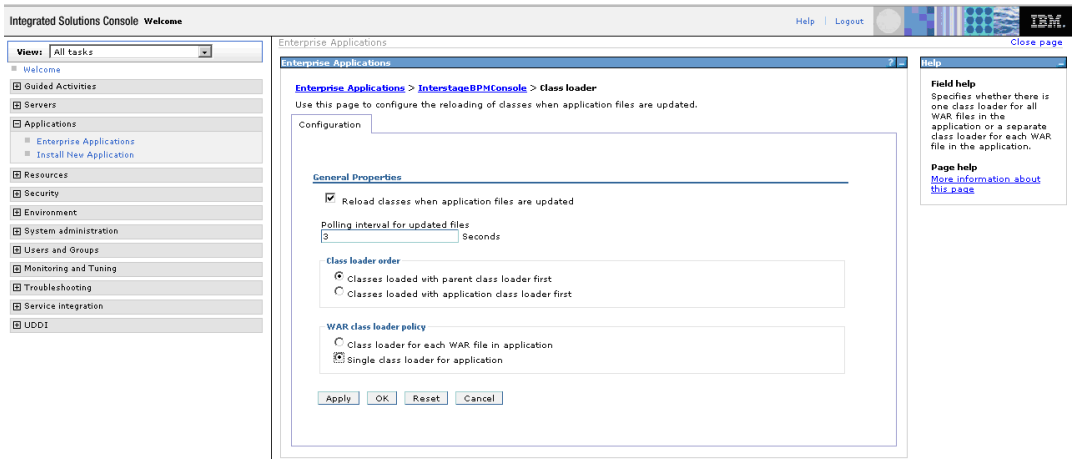

Figure 21: Enterprise Application Class Loader Details Page

6. In the **WAR class loader policy** section, select the **Single class loader for application** option, and click **Apply**. Save your changes.
   The **Enterprise Applications** page is displayed. `InterstageBPMConsole` appears on the list with a red icon indicating that it has not been started.

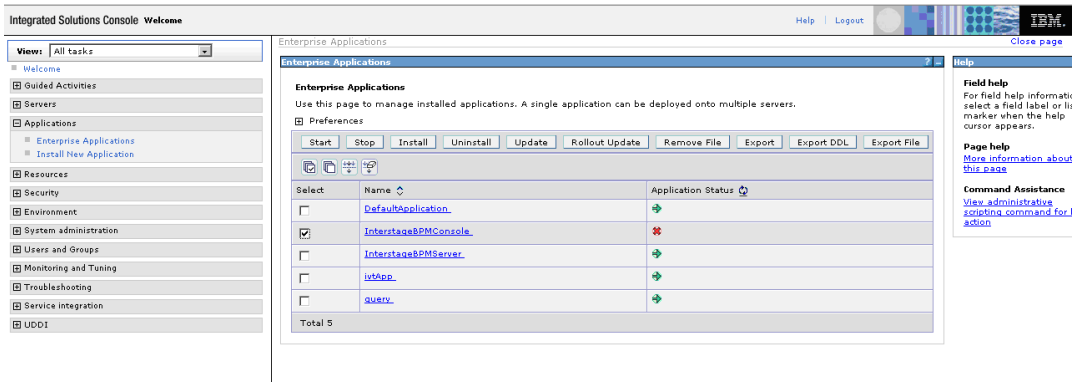

Figure 22: Enterprise Applications Page with Console Not Started

7. Select **InterstageBPMConsole** and click **Start** to start the Interstage BPM Console application.

A pop-up asking you to **Please Wait...** appears. This could take a few minutes. When the Interstage BPM Console has started, the Enterprise Applications page appears with a message informing you that the Console has started.

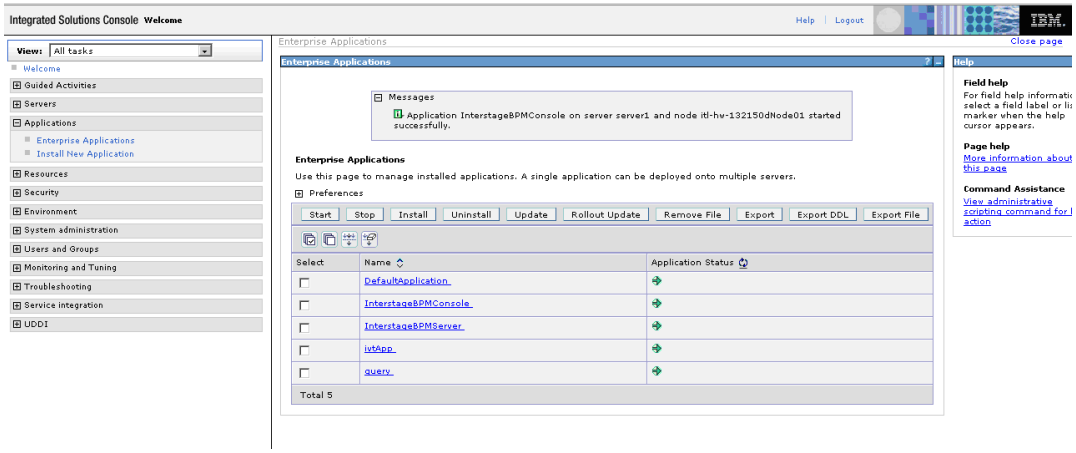

Figure 23: Enterprise Applications Page with Console Started

8. In a Web browser
   - To access the Interstage BPM Tenant Management Console, enter the URL `http://<hostname>:<port>/console/TenantManager.page`
   - To access the Interstage BPM Console, enter the URL `http://<hostname>:<port>/console/<TenantName>/`

   Here:
   - `<hostname>` is the machine name of the computer upon which you have deployed the Interstage BPM Console.
   - The default port is `9080`.
   - `<TenantName>` is the name of the tenant; if you are in non-SaaS mode, this is `default`.
   - It is recommended to use the tenant name in the URL with the same case as it has been created with during deployment. Tenant name in the URL is case sensitive for accessing certain features.

   The Login page appears.
9. Log on to Interstage BPM Console or Tenant Management Console.

You can now begin using Interstage BPM Console and Tenant Management Console. Refer the *Interstage BPM Console Online Help* and *Interstage BPM Tenant Management Console Online Help* for details.

Note: For information about further configuration of Interstage BPM Console, refer *Interstage BPM Console - Other Configurations* on page 66

7 Deploying only the Interstage BPM Console

Use the information in this chapter if, having already installed and deployed Interstage BPM Server separately, you plan to deploy only Interstage BPM Console.

It is recommended that you read the overview of the deployment procedure before starting the deployment.

Refer to *System Requirements for Interstage BPM Server and Console* on page 15 and to the Release Notes for details on the required components.

Note: When you deploy Interstage BPM Console, you also automatically deploy Interstage BPM Tenant Management Console.

7.1 Permissions Required for Deployment

You must have read, write, and execute permissions on the installation directory of Interstage BPM Console.

7.2 Overview of Installation and Deployment of Interstage BPM Console

This section summarizes the steps required for installing and deploying only Interstage BPM Console.

Installing and Deploying only Console on WebSphere

1. Make sure Interstage BPM Server is already installed and deployed

   Refer chapter *Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server* on page 23
2. Make sure the application server is running

   Refer section *Installing and Starting WebSphere Application Server* on page 21
3. Deploy Interstage BPM Console to the application server using the Deployment Tool

   Refer section *Deploying Interstage BPM Console Using the Deployment Tool* on page 65
4. Make sure Interstage BPM Server is running

   Refer section *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58
5. Start Interstage BPM Console

   Refer section *Starting Interstage BPM Console* on page 66
6. If required, perform further configurations for Interstage BPM Console

   Refer section *Interstage BPM Console - Other Configurations* on page 66

7.3 Deploying Interstage BPM Console Using the Deployment Tool

Prerequisites:

- You have already installed and deployed Interstage BPM Server, OR are in the process of deploying Server and Console together.
- The application server is running.

If you are deploying only Interstage BPM Console, start from step 1.

If you are in the process of deploying Interstage BPM Server and Console together, start from step 4.

To deploy Interstage BPM Console using the Deployment Tool:

1. Start the Deployment Tool. Refer section *Starting the Deployment Tool* on page 37.
2. On the **Welcome** page, select the mode of operation. On the **Application Server Selection** screen select the application server, and components to be deployed (that is, **Console**). For details, refer section *Operation Mode and Application Server Selection* on page 40.
3. On the application server configuration page, provide settings for your application server.

   Refer section *WebSphere Application Server Settings* on page 41
4. On the **Console Configuration** page, provide your settings for Interstage BPM Console.

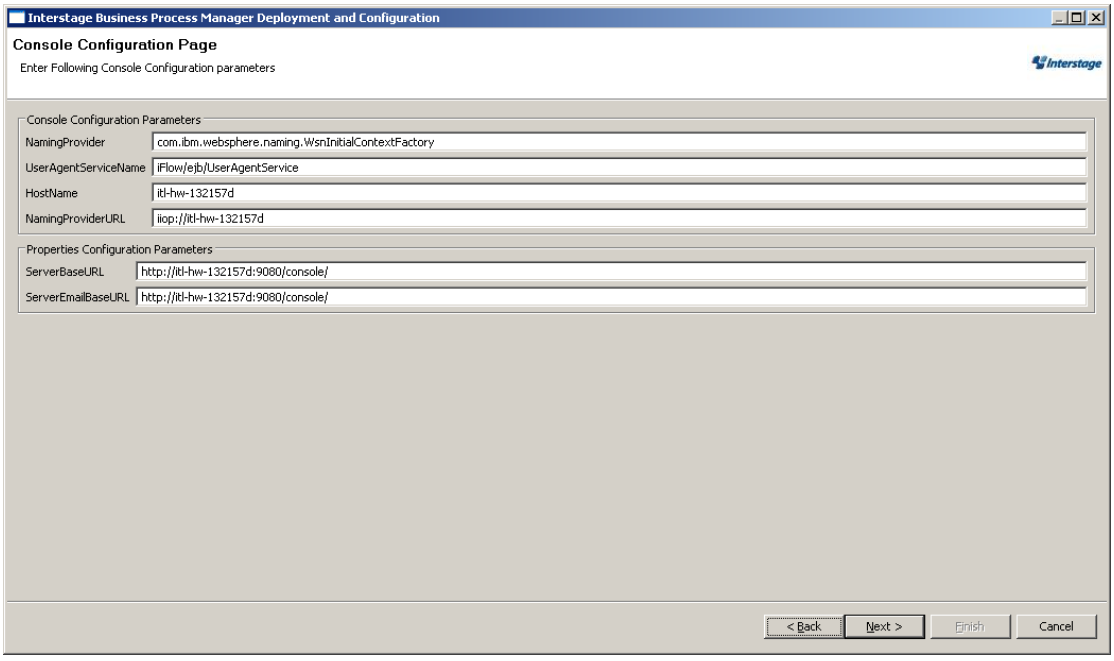

Figure 24: Console Configuration page

a) In the **Console Configuration Parameters** area, depending on your application server, the values for the following fields are auto-populated:**NamingProvider**, **UserAgentServiceName**, **NamingProviderURL**, (and **ServerBaseURL**, **ServerEmailBaseURL**, if deploying Interstage BPM Server and Console together).

b) In the **Properties Configuration Parameters** area, the value for **ServerBaseURL** is auto-populated in the format `http://<ConsoleHost>:<ConsolePort>/console/`

Example: `http://docone:49950/console/`

This is the base URL to access Interstage BPM Console. Console-related functions are accessed by appending appropriate values to this base URL.

Note: This parameter does not appear in the Console Configuration page when deploying only Interstage BPM Console.

c) In the **Properties Configuration Parameters** area, the value for **ServerEmailBaseURL** is auto-populated in the format `http://<ConsoleHost>:<ConsolePort>/console/`

Example: `http://docone:49950/console/`

Console Web Services are accessesed by appending appropriate values to this base URL.

Note: This parameter does not appear in the Console Configuration page when deploying only Interstage BPM Console.

d) If you are deploying only Console:

1. Click **Finish**.
2. For further steps refer *Overview of Installation and Deployment of Interstage BPM Console* on page 64.

e) If you are deploying Console together with Interstage BPM Server, click **Next**. For further steps refer *Database Selection* on page 44.

7.4 Starting Interstage BPM Console

Prerequisites: You have finished deploying Console on your application server.

To start Interstage BPM Console, refer section *Starting Interstage BPM Console and Tenant Management Console* on page 61

7.5 Interstage BPM Console - Other Configurations

This section describes other configurations for Interstage BPM Console after you have deployed it on an application server.

7.5.1 Configuring Interstage BPM Console to work with Interstage Analytics

Pre-requisites

Make sure that you have installed Interstage Analytics and Interstage BPM including Interstage BPM Console on the same machine.

To configure Interstage BPM console to display Analytics information:

1. Update the following parameters in console.conf file
   - `InterstageAnalyticsHostName`
   - `InterstageAnalyticsPort`
2. Delete the `ibpmaApiIF.jar` from `/WEBINF/lib` directory of the Console deployment directory.

Note: The location of this file can be different for different application servers.
- For WAS: `<Interstage BPM Deployment Directory>/client/InterstageBPMConsole.ear/console.war/WEB-INF/lib`

3. Copy the following JAR files from `WEB-INF/lib` of the Analytics installation directory to `WEBINF/lib` of the Console deployment directory.
   - `ibpmm.jar`
   - `json-lib-2.1-jdk13_fj.jar`
   - `jakarta-oro.jar`
   - `ezmorph-1.0.4.jar`
   - `commons-beanutils.jar`
   - `commons-collections-3.1.jar`
   - `commons-lang-2.1.jar`
   - `commons-logging.jar`
4. Restart the Application Server or the Console Web Application.

Note: Only the user registered in Interstage Analytics can access analytics information from Console. Ensure that your Interstage BPM Console username is also a registered Interstage Analytics username.

7.5.2 Configuring the SOAP Listener

Before you can configure the SOAP Listener, you must make sure that your Interstage BPM Server and Console are running properly and that you are logged in to the Console.

For instructions, refer *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58, and *Starting Interstage BPM Console and Tenant Management Console* on page 61.

To configure the SOAP Listener:

1. Check to make sure that the services required for SOAP Messaging are available with the following instructions:
   a) Enter the following URL in the Location field of your browser:

      `http://<host>:<port>/<context-root>/<tenant-name>/soap/soapindex.jsp`

      Example:

      `http://ConsoleHost:9001/console/default/soap/soapindex.jsp`

   b) If no page is displayed, the SOAP Services are not available, so you must start them by running the following batch file:

      `<Interstage BPM Console>/web/soap/soaplisteners_start.bat` on Windows or

      `<Interstage BPM Console>/web/soap/soaplisteners_start.sh` on UNIX.

Note: In case you need to stop the SOAP services, run the following batch file:

`<Interstage BPM Console>/web/soap/soaplisteners_stop.bat` on Windows or

`<Interstage BPM Console>/web/soap/soaplisteners_stop.sh` on UNIX.

Note: You may need to update the following in the startup and stop scripts before running them
- JAVA_HOME and INSTALL_DIR properties
- MACHINE_NAME and port numbers in all URLs

c) Click Run.
The Apache SOAP Admin page appears.

d) Click List.
If the required services are available, a page appears that lists the following services:
- urn.POClientListener
- urn.HRClientListener

2. Update your Client authentication by making the following changes in the file `<Interstage BPM Console>/web/soap/clientlisteners.xml`:
   - <servertype> “EE” for Enterprise Edition
   - <servername> <Server-Host>Flow
   - <userid> userid to be used to log in to the Server
   - <password> password to be used to log in to the Server.
3. Update the log file location by replacing `<Interstage BPM Console Installation Directory>/web/soap/` with path to the SOAP directory in the `log4j.properties` file.
4. Make sure that the following files are in the CLASSPATH of the Web Container in which the Console is deployed:

Note: If you are installing the Console on the Interstage Application Server, this step is unnecessary.

   - iFlow.jar
5. Restart the Web Container.

8 Undeploying and Uninstalling Interstage BPM Server and Console

This chapter explains how to undeploy Interstage BPM Server and Console from an application server and how to uninstall Interstage BPM.

8.1 Undeploying Interstage BPM Server and Console from the Application Server

You can undeploy an instance of the Interstage BPM Server and/or Interstage BPM Console from the application server using the Interstage BPM Deployment Tool.

Note: When you remove a server or console instance, the Interstage BPM database will not be removed.

To undeploy an Interstage BPM Server or Console instance:

1. Log out of all Interstage BPM Clients and close all Browser windows.
2. Start the Interstage BPM Deployment Tool.
   For details, refer to section *Starting the Deployment Tool* on page 37.
3. **For Windows:** Select the appropriate radio button on the **Deployment Tool Option Screen** and click **Next**.

Note: If you have already removed the Interstage BPM Server and Console from the application server, make sure that you select the **Do not launch Deployment Tool** radio button.

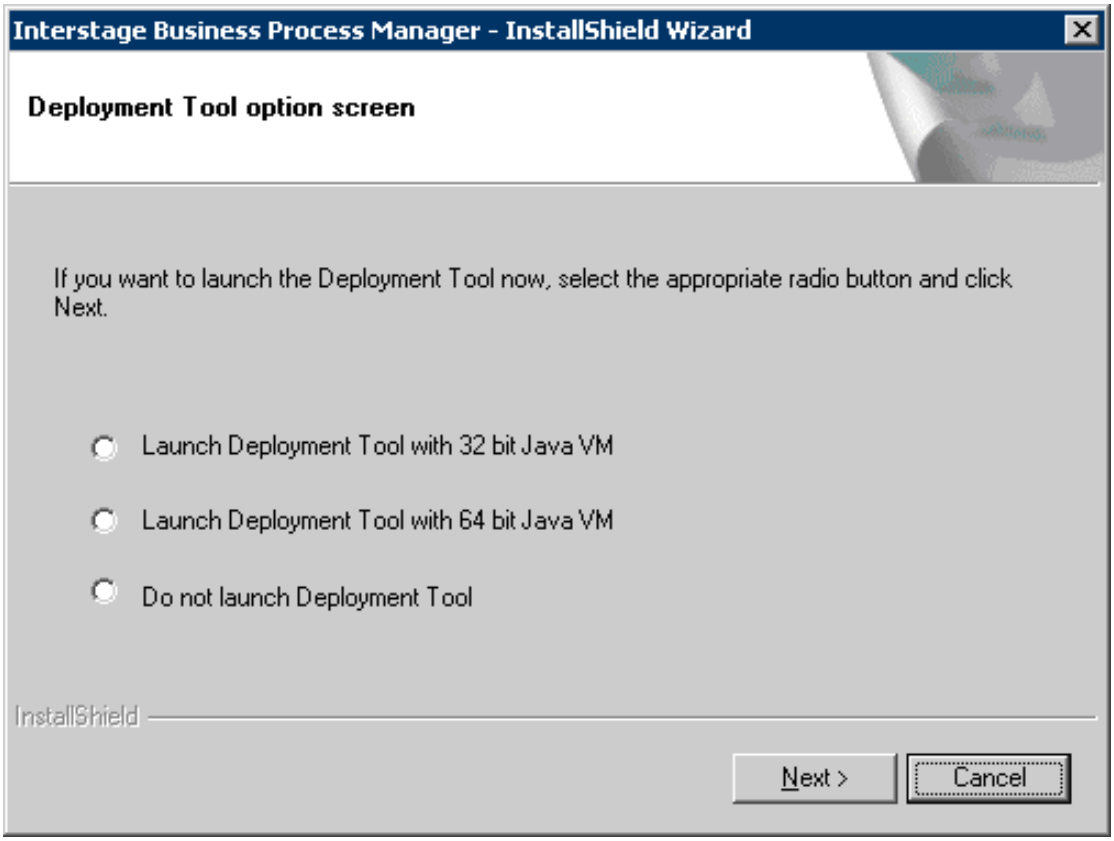
Interstage Business Process Manager - InstallShield Wizard
Deployment Tool option screen
If you want to launch the Deployment Tool now, select the appropriate radio button and click Next.
Launch Deployment Tool with 32 bit Java VM
Launch Deployment Tool with 64 bit Java VM
Do not launch Deployment Tool
InstallShield
Next >
Cancel

Figure 25: Starting Deployment Tool - For Windows

4. On the **Welcome** screen, click **Server/Console Instance Removal**.
5. On the **Application Server Selection** screen:
   a) Select the type of application server from which you want to undeploy.
   In this case, select IBM WebSphere.

b) Select the checkbox(es) for the Interstage BPM component (Server and/or Console) you want to undeploy.

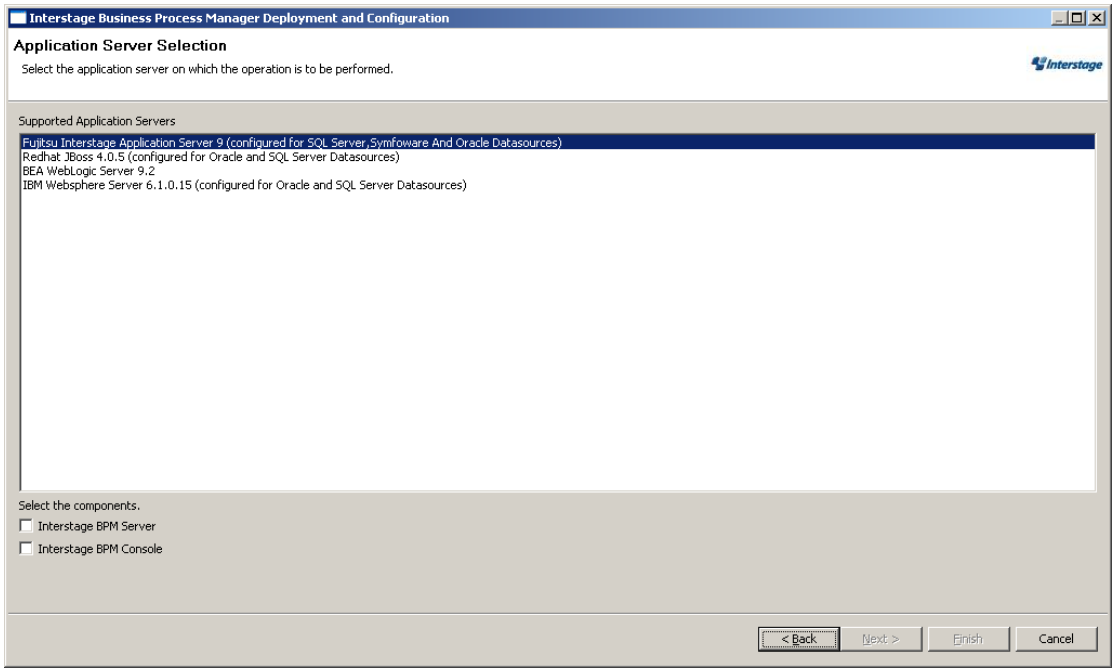
Interstage Business Process Manager Deployment and Configuration
Application Server Selection
Select the application server on which the operation is to be performed.
Interstage
Supported Application Servers
Fujitsu Interstage Application Server 9 (configured for SQL Server,Symfoware And Oracle Datasources)
Redhat JBoss 4.0.5 (configured for Oracle and SQL Server Datasources)
BEA WebLogic Server 9.2
IBM Websphere Server 6.1.0.15 (configured for Oracle and SQL Server Datasources)
Select the components.
Interstage BPM Server
Interstage BPM Console
< Back
Next >
Finish
Cancel

Figure 26: Application Server and Component selection sample screen

6. Click **Next**.
7. On the **WebSphere 6.1 Application Server Configuration** screen, specify the server instance that you want to remove.

Provide the information that you entered when creating the server instance. For more information, refer to section *WebSphere Application Server Settings* on page 41.

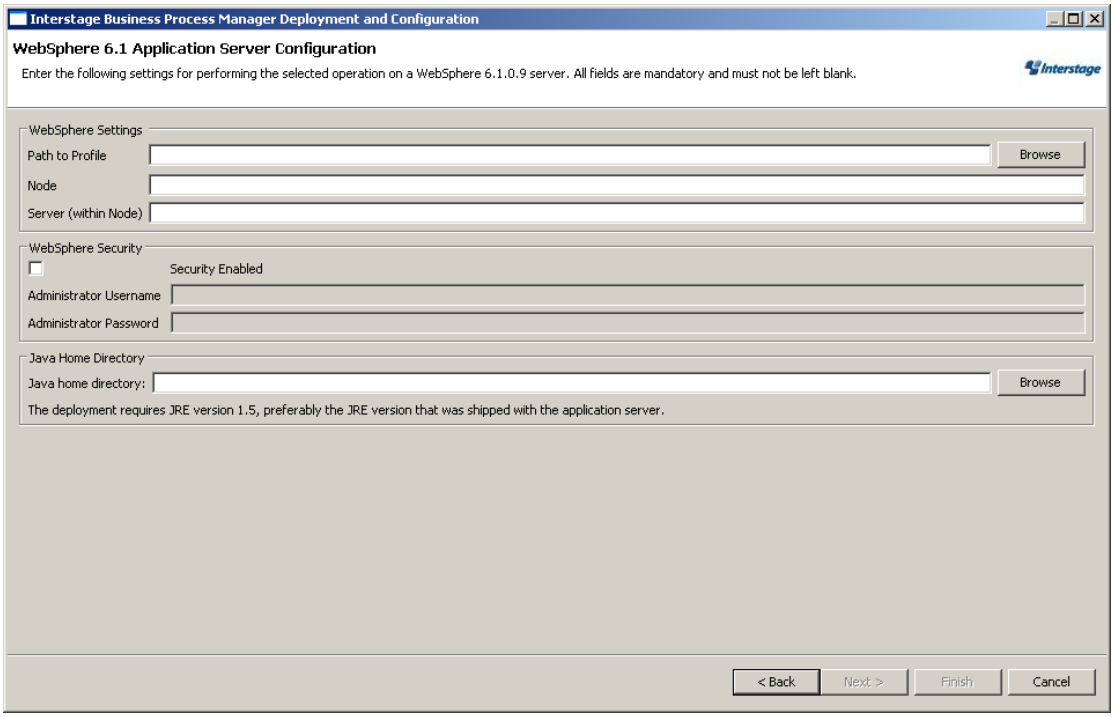
Interstage Business Process Manager Deployment and Configuration
WebSphere 6.1 Application Server Configuration
Enter the following settings for performing the selected operation on a WebSphere 6.1.0.9 server. All fields are mandatory and must not be left blank.
Interstage
WebSphere Settings
Path to Profile
Browse
Node
Server (within Node)
WebSphere Security
Security Enabled
Administrator Username
Administrator Password
Java Home Directory
Java home directory:
Browse
The deployment requires JRE version 1.5, preferably the JRE version that was shipped with the application server.
< Back
Next >
Finish
Cancel

Figure 27: WebSphere Settings

8. Click **Next**.
9. Make sure that all the information displayed on the **Review Information** screen is correct.
10. Click **Finish** to start the removal.

    At the end of the process, a message is displayed notifying you that the server/console has been removed from the application server.
11. Click **OK** to exit the Deployment Tool.

8.2 Uninstalling Interstage BPM

When you uninstall Interstage BPM using its uninstallation program, everything **except** the following is removed:

- The Interstage BPM database
- Log files and configuration files located in `<Interstage BPM Server Installation Directory>` or in one of the subdirectories

During uninstallation, the Deployment Tool is started so that you can remove Interstage BPM Server from the application server if you have not done so yet.

To uninstall Interstage BPM:

1. If you have not yet removed the Interstage BPM Server/Console from the application server:

   a) Log out of all Interstage BPM Clients and close all Browser windows.

2. Start the Interstage BPM uninstallation program:
   - On Windows, select **Start** > **Programs** > **Interstage Business Process Manager** > **Uninstall**.
     Alternatively, you can use the Windows Control Panel (**Start** > **Settings** > **Control Panel** > **Add or Remove Programs** > **Interstage Business Process Manager**)
   - On Solaris, run `<Interstage BPM Server Installation Directory>/_uninst/uninstall.sh`.
   - On Linux, run `<Interstage BPM Server Installation Directory>/_uninst/uninstall.sh`.
3. For platforms **other than Windows**, the **Welcome** screen will appear. On this screen, click **Next** to launch the **Deployment Tool**.
4. **On Windows:** Select the appropriate radio button on the **Deployment Tool Option Screen** and click **Next**.

Note: If you have already removed the Interstage BPM Server and Console from the application server, make sure that you select the **Do not launch Deployment Tool** radio button.

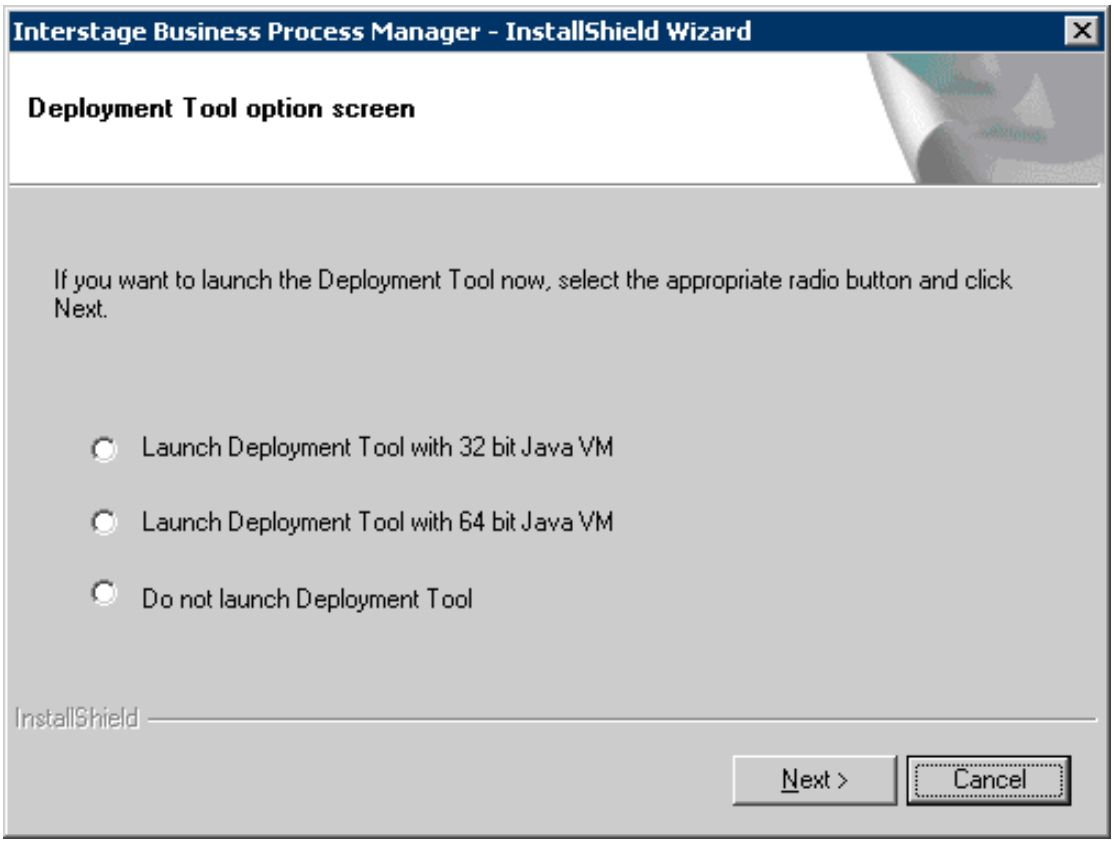
Interstage Business Process Manager - InstallShield Wizard
Deployment Tool option screen
If you want to launch the Deployment Tool now, select the appropriate radio button and click Next.
Launch Deployment Tool with 32 bit Java VM
Launch Deployment Tool with 64 bit Java VM
Do not launch Deployment Tool
InstallShield
Next >
Cancel

Figure 28: Start Deployment Tool - For Windows

5. In the Deployment Tool, do one of the following:
   - If you have already removed the Interstage BPM Server and Console from the application server, click **Cancel** to exit the Deployment Tool.

- If you have not yet removed the Interstage BPM Server and Console from the application server, click **Server/Console instance removal** to start the removal process.

  For further instructions, refer to section *Undeploying Interstage BPM Server and Console from the Application Server* on page 69.

In either case, after exiting the Deployment Tool, you will return to the uninstallation program.

6. On Windows, when asked if you want to completely remove the selected application and all of its features, click **Yes** /**Next**.
7. During uninstallation, the uninstallation program may ask you to confirm the deletion of some files. Decide whether you want to keep or remove the files.
8. When the uninstallation is complete, click **Finish**.
9. Make sure that the `<NodeName>.<ServerName>-<NodeName>IBPMBuss` directory (and all of its subdirectories) under `<WebSphere Installation Directory>AppServer/profiles/AppSrv01/databases/com.ibm.ws.sib` directory have been deleted by the uninstallation program. If they have not been deleted, delete them. If these directories remain, the WebSphere Application Server will fail to start after re-installation of the Interstage BPM software.

9 Upgrading Interstage BPM from Previous Versions

9.1 Upgrading from Previous Versions of Interstage BPM

To upgrade from previous versions of Interstage BPM:

1. Before uninstalling the previous version of Interstage BPM, back up the following:
   - The Interstage BPM database - This is the only way to ensure the retention of your current Interstage BPM data. The upgrade process automatically migrates (and therefore overwrites) process definitions to the current release's formats. Use the default functionalities of your database software for backing up your database.
   - The `ibpm.properties` file, if upgrading from Interstage BPM v10.x - This preserves your previous server configurations. (If upgrading from Interstage BPM v7.x or v8.x, the uninstallation program automatically saves your configuration files with the suffix `previous` appended to their file names. For example, the `ibpm.properties` file is saved as `ibpmprevious.properties`.) After installing the new version of Interstage BPM, you can use the saved properties file to manually configure your new server installation. For information on how to change the server configuration, refer to the *Interstage Business Process Manager Server Administration Guide*.
   - All files from the previous `agents/` folder
   - All files from the previous `calendar/` folder
   - The `resources/DataSourceDefinition.xml` file
   - The `resources/fileListenerConf.xml` file
   - The `DmsCollections.xml` file and the directories specified in it - these directories contain data that users have previously uploaded.
2. Uninstall the previous version of Interstage BPM according to the instructions for that version.
3. Make sure that you have the required permissions for installation and deployment.
   For details, refer to section *Permissions Required for Installation and Deployment* on page 29.
4. Install Interstage BPM Server according to the instructions in section *Installing Interstage BPM* on page 31.
5. Upgrade your database as follows:
   a) If the Deployment Tool is not running, start it using the instructions in section *Starting the Deployment Tool* on page 37.
   b) On the **Welcome** screen of the Deployment Tool, select **Database Upgrade**.
   c) Click **Next**.
   d) On the **Database Selection** screen, select the database system you are using.
   e) Click **Next**.
   f) On the **Database Configuration** screen, specify the settings for your database.
      If you are using Oracle, refer to section *Oracle Settings* on page 47 for a detailed explanation.
      If you are using Microsoft SQL Server, refer to section *Microsoft SQL Server Settings* on page 44 for a detailed explanation.
      If you are migrating from an Interstage BPM **Advanced Edition**, select the **Upgrade from AE to EE Version** check box.

Note:	If you are upgrading from an Interstage BPM **Enterprise Edition**, do not select the **Upgrade from AE to EE Version** check box. Otherwise, your database may get incorrectly updated.

g) Click **Next**.

h) Make sure that all the information displayed on the **Review Information** screen is correct.

i) Click **Finish** to start upgrading the database.

At the end of the process, a message is displayed notifying you that the database has been upgraded.

j) Click **OK** to exit the Deployment Tool.

6. Deploy the Interstage BPM Server and/or Console according to the instructions in section *Deploying Server Instances with Console, OR only Server Instances* on page 39.

Note: On the **<Application Server> Configuration** screen, **do not select** the **Configure Database on this Machine** option. Otherwise, the old database will be overwritten and you will lose all of the previous work that is stored in the database.

Note: On the **Interstage BPM Super User** screen, **ensure** you select the **Non-SAAS mode**.

7. Migrate application resources as described in *Migrating Application Resources from Previous Versions to Interstage BPM v11.0* on page 76.
8. Start the Interstage BPM Server and Console. Refer the following topics:
   - *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58
   - *Starting Interstage BPM Console and Tenant Management Console* on page 61
9. If needed, migrate application owners as described in *Migrating Application Owners from Previous Versions to Interstage BPM v11.0* on page 78.

Interstage BPM is now upgraded to the latest version.

9.2 Migrating Application Resources from Previous Versions to Interstage BPM v11.0

Pre-requisites: You have completed the following steps as described in *Upgrading from Previous Versions of Interstage BPM* on page 75:

- You have uninstalled the previous version of Interstage BPM
- You have installed the new version of Interstage BPM
- You have upgraded the database
- You have deployed an instance of Interstage BPM Server (and, if required, Console) in non-SaaS mode.

To migrate application resources from previous versions to Interstage BPM v11.0:

1. Copy the `DmsCollections.xml` file of the previous version to the `<Interstage BPM Installation Directory>/server/instance/default/tenants/Default/resources/` folder.
2. Copy the `apps` folder from `<Interstage BPM Installation Directory>/server/instance/default/tenants/Default/` to the DMSRoot `<Path>` you choose to specify in `DmsCollections.xml`.

Note: For Solaris and Linux environments, while specifying the DMSRoot, ensure you use the correct case in the file path.

3. For each application, do one of the following:
   a) If an application already contains the `agentsConfig.xml` file (located in `<DMSRoot>/apps/<application id>/`), add the following code to that file:

```
<ActionAgent>
   <Name>@FTP</Name>
   <Description>FTP Agent</Description>
   <RetryInterval>20</RetryInterval>
   <EscalationInterval>1</EscalationInterval>

<ClassName>com.fujitsu.iflow.serveree.impl.actionagent.ServiceAgent</ClassName>

   <ConfigFile>ftp.xml</ConfigFile>
</ActionAgent>
<ActionAgent>
   <Name>@HTTPAgent</Name>
   <Description>HTTP Agent</Description>
   <RetryInterval>20</RetryInterval>
   <EscalationInterval>1</EscalationInterval>

<ClassName>com.fujitsu.iflow.serveree.impl.actionagent.httpservice.HTTPServiceAgent</ClassName>

   <ConfigFile>HTTPAgent.xml</ConfigFile>
</ActionAgent>
```

   b) If an application does not contain the `agentsConfig.xml` file (located in `<DMSRoot>/apps/<application id>/`)
      - Copy the `agentsConfig.xml` file of the previous version to the `<DMSRoot>/apps/System` folder.
      - Edit the copied `agentsConfig.xml` to remove '`agents/`' from the text within the `<ConfigFile>` tag.
4. Copy the `fileListenerConf.xml` file of the previous version to the `<DMSRoot>/apps/System` directory.
5. Copy the previous versions of each of the following to each application folder in the `<DMSRoot>/apps/<application id>/` directory.
   - `HTTPAgent.xml` file
   - `ftp.xml` file
   - Business Calendar (`.cal`) files
   - `DataSourceDefinition.xml` file

Note: Do not migrate Decision Table Management (DTM) configuration files from previous versions of Interstage BPM; Interstage BPM v11.0 does not support DTM configuration files of previous versions.

Note: From version 11.0 of Interstage BPM:

- Parent process definitions can only call sub process definitions if they exist in the same application. To continue using parent process definition from previous versions in Interstage BPM v11.0, enusre their sub process definitions exist in the same application as the parent process definition.
- You cannot migrate process instances from one application to another.
- You cannot copy process definitions from one application to another.

9.3 Migrating Application Owners from Previous Versions to Interstage BPM v11.0

When you migrate pre-v11.0 applications to Interstage BPM v11.0, the user group having the role of AdminRole is automatically set as the owner of the application. After application migration, if you want to assign application ownership to a group other than the AdminRole, you can do so by using Interstage BPM Console. For information about changing application owners in Interstage BPM Console, refer the *Managing Applications* section of the *Interstage BPM Console Online Help*.

9.4 Migrating WebDAV Repository and UDDI Registry from Previous Versions to Interstage BPM v11.0

If you had configured pre-v11.0 Interstage BPM to use WebDAV repository and UDDI registry (such as Centrasite), you need to synchronize the Interstage BPM Server with your WebDAV and UDDI repositories before you can use already published information or publish new process definitions. Use the following steps to achieve this:

1. After upgrade and configuration of Interstage BPM Server and Console, start the Interstage BPM Server and Console.
   - *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58
   - *Starting Interstage BPM Console and Tenant Management Console* on page 61
2. Login to Interstage BPM Console as an administrator.
3. After choosing an application, in the **System Administration tab**, click **Application Settings**.
4. In the **Application Settings** page, click **Synchronize with Repository**, and then click **Synchronize** in the pop-up that appears.

   Once synchronization is successful, an appropriate message is displayed.

Now Interstage BPM v11.0 is ready to be used with WebDAV and UDDI repositories

9.5 Additional Steps for Handling Pre-11.0 Console URLs

In version 11.0 of Interstage BPM Console, the Interstage BPM Console URL has been changed, making older versions of URLs such as those of Remote SubProcesses, Service Registry, and so on incompatible when called from previous versions of Interstage BPM.

To overcome this problem, deploy the Compatibility Proxy WAR provided in this release using the steps listed in this section.

Note:
1. For a remote subprocess, perform the steps listed here only in the following cases:
   - When both the Parent and child process instances are running, and you upgrade Interstage BPM on the parent server to v11.0
   - When the parent process is running but the child process instance has not yet started, and you upgrade Interstage BPM on the child server to v11.0
2. Support for HTTPS is not available in this release.

In order to use the Compatibility Proxy for supporting pre-V11.0 URLs, the following requirements must be met:

- When a pre-V11.0 server is upgraded to V11.0, the Non-SaaS mode should be selected during upgrade.
- The Compatibility Proxy should be deployed at the original pre-V11 context root, and the V11 Console should be deployed at a different context root. For example, if the pre-v11.0 Console was deployed at the context root `ibpmconsole`, then you should install the compatibility proxy at `ibpmconsole` and the V11 Console at any other context root, for example, `console`. The default context root for V11 Console is `console`, which is different from the default context root for any previous version. So if you have followed the defaults, this requirement rule will be automatically satisfied.
- V10.x had the restriction that two applications cannot have process definitions with the same name. This restriction has been removed in V11.0. But to use the Compatibility Proxy, the same restriction needs to be followed, that is, two applications should not have process definitions with the same name.

9.5.1 Steps to Overcome the URL-incompatibility Problem

Pre-requisites: You have completed the following steps as described in *Upgrading from Previous Versions of Interstage BPM* on page 75:

- You have uninstalled the previous version of Interstage BPM
- You have installed the new version of Interstage BPM
- You have upgraded the database
- You have deployed an instance of Interstage BPM Server and Console in non-SaaS mode.
- Make sure that the WebSphere Application Server is running.

1. Create a folder whose name corresponds to your pre-v11.0 context root (for example `ibpmconsole`) on your machine. For example purposes, the following directory will be used:

   On UNIX or Linux:

   ```
   /opt/FJSVibpm/ibpmconsole
   ```

   On Windows:

   ```
   c:\fujitsu\InterstageBPM\ibpmconsole
   ```

2. Copy `webserviceproxy.war` from the console directory of your Interstage BPM Console Installation CD or CD Image to the directory that you just created on your machine.
3. Extract the files from `webserviceproxy.war` into the `ibpmconsole` directory. Use the following Java command:

   ```
   jar -xvf webserviceproxy.war
   ```

4. After extracting the jar, edit the `proxy.conf` file under `<Extraction Directory>\WEB-INF\config` and update the `ServerBaseURL` to the **V11 port number and context root**.

5. Edit the `web.xml` file under `<Extraction Directory>\WEB-INF\` as shown below:

   Change

   ```
   <url-pattern>/*</url-pattern>
   ```

   to

   ```
   <url-pattern>*.jsp</url-pattern>
   ```

6. Now run the following command from the location where the extracted contents of **webservicesproxy.war** are available.

   ```
   jar -cvf ibpmconsole.war *.*
   ```

7. Start the WebSphere Server Default Server and the Interstage BPM Server to which you want to connect.
8. Login to the WebSphere Administration Console if you have not already done so.
9. Select Applications>Install New Application.
10. Click **Browse** and navigate to the location of the WAR file (`ibpmconsole.war`).
11. Enter the value for **Context Root**. This should be same as the context root at which Pre V11 IBPM was running (like ibpmconsole for V10.1).
12. Click **Next**.

    A pop-up appears asking you to Please Wait... The Interstage BPM Console is being deployed. This could take several minutes. Please wait while it is being installed. When the deployment has completed, **Step 1: Select installation options** will appear.

13. Accept all defaults and click **Next**.

    Step 2: Map modules to servers page appears.

14. Select **WebServiceProxy** and click **Next**.

    Step 3: Map virtual hosts for Web modules appears.

15. Select **WebServiceProxy** and click **Next**.

    Step 4: Summary appears. Kindly ensure that the port that will be available for running the deployed application is the same as of Pre V11 application.

16. Click **Finish** to complete the installation.

    An installation status page appears along with a pop-up asking you to Please Wait... This could take several minutes. Status messages will begin to appear. The Interstage BPM Console is being deployed. Please wait while the Console is being deployed. When the deployment has completed, the message **Application fujitsu-console-ear installed successfully.** appears.

17. Click the **Save directly to Master Configuration** link to save your changes.

    The War file will be saved as a new Web Application in the WebSphere Application Server. When saving is completed, the Preparing for the application installation page will re-appear.

18. Select war file installed and click **Start** to start the WebServicesProxy application.

    A pop-up asking you to Please Wait... appears. This could take a few minutes. When the Interstage BPM Console has started, the Enterprise Applications page appears with a message informing you that the Console has started.

19. Start the Interstage BPM Server and Console. Refer the following topics:
    - *Configuring Interstage BPM for WebSphere Application Server 6.1 and Starting Interstage BPM Server* on page 58
    - *Starting Interstage BPM Console and Tenant Management Console* on page 61

10 Setting Up a Directory Service

This chapter provides instructions for setting up your Directory Service.

Interstage BPM comes with configuration files that you use to configure the Directory Service. These configuration files are located in the `<Interstage BPM Server Installation Directory>/client/samples/configuration` directory. During deployment, configuration files for the Directory Service that you selected in the Deployment Tool were updated with the settings that you specified.

The `<Interstage BPM Server Installation Directory>/client/samples/configuration` directory contains configuration files for all of the supported Directory Services. However, the Deployment Tool only updated the configuration files for the selected Directory Service. Configuration files for other Directory Services contain placeholders and cannot be used without modifications. If you selected Interstage BPM's local user store during deployment, no configuration files were updated.

Note: Do not edit the configuration files in the `<Interstage BPM Server Installation Directory>/client/samples/configuration` directory because these files will be overwritten if you re-execute a server instance setup. Before making any changes, copy the configuration files to another directory and edit the copy.

10.1 Setting Up Microsoft® Active Directory

This section provides instructions for setting up Microsoft® Active Directory. Active Directory uses a form of the Lightweight Directory Access Protocol (LDAP). Like all LDAP-type Directory Services, Active Directory organizes people into Groups, and maintains a user profile with the appropriate permissions for each user.

The Active Directory setup procedure must be performed on the domain controller for your network by an Administrator.

To customize your Active Directory Server installation:

1. Import the `IBPMADAdd.ldif` file into your Directory Server. The `IBPMADAdd.ldif` file contains the default Interstage BPM users and Groups.
2. Add users and Groups to the Directory Service.

10.1.1 Importing the IBPMADAdd.ldif File

To effectively import the `IBPMADAdd.ldif` file, you must have permission to import the file on the machine containing the Active Directory domain controller. The batch file `importAD.bat` imports the `IBPMADAdd.ldif` file, but it must be moved to the domain controller machine with the IBPMADAdd.ldif file.

Importing the LDIF file generated by the Interstage BPM installation program results in the following:

- The `IflowGroups` and `IflowUsers` Groups are added to the Organizational Unit (ou) specified during the installation of Interstage BPM.
- The Organizational Units `people` and `groups` are added to Active Directory.
- The default Interstage BPM Roles `Role` and `AdminRole` are added to the Organizational Unit `groups`.
- The default user (typically `ibpm_server1`) is added to the Organizational Unit `people`.
- The default Groups `Role` and `AdminRole` are added to the members of `IflowGroups`.
- The default user (typically `ibpm_server1`) is added to the members of `IflowUsers`.

To import the IBPMADAdd.ldif file:

1. Log on as an Administrator to the computer containing the Active Directory domain controller.
2. Ensure that the Password Policies of the Domain Security Policy are set as follows:
   - Minimum password length: 0 characters
   - Password must meet complexity requirements: Disabled

   If you changed these settings remember the current settings, so you can restore them later.
3. If the Active Directory server is installed on a computer different from the Interstage BPM Server, copy the `IBPMADAdd.ldif` file and the `importAD.bat` file located in `<Interstage BPM Server Installation Directory>/client/samples/configuration` to the Active Directory Server.
4. Ensure that the `IBPMADAdd.ldif` file is in your current directory.
5. Execute `importAD.bat`.
6. Restore the Password Policies to their original settings if you changed them in a previous step.

10.1.2 Using Existing Active Directory Users and Groups

If you are new to Interstage BPM and are already using Active Directory as the Directory Service to maintain your organization's Users and Groups, you can use your existing directory structure with Interstage BPM. You can do this by designating your LDAP Users as Interstage BPM users and your LDAP Groups as Interstage BPM Roles. This involves the modification of two special LDAP Groups, `IflowUsers` and `IflowGroups`.

When you imported the IBPMADAdd.ldif file (refer to section *Importing the IBPMADAdd.ldif File* on page 82), you created two LDAP Groups under your main Organizational Unit (ou) called `IflowUsers` and `IflowGroups`. Of course, this assumes that you specified your main organizational unit when you deployed Interstage BPM. These two special LDAP Groups can be used to allow your LDAP Users and Groups access to Interstage BPM.

To give your LDAP Users access to Interstage BPM as Interstage BPM users, add them as members of the `IflowUsers` group. You can add each user individually or add a group that contains the users. Users in the Group sub-levels are also given access. To give your LDAP Groups access to Interstage BPM as Interstage BPM Roles, add them as members of the IflowGroups Group.

10.1.3 Adding New Users with an LDIF File

You can add new users to Active Directory by manually editing the LDIF file, then importing it.

To add new users with an LDIF File:

1. Log on as an Administrator to the computer where the Active Directory domain controller is located.
2. The Domain Security Policy is an administrative tool provided by Microsoft®. Access the Domain Security Policy for that computer.
   - To display the Domain Security Policy on Windows Server 2003, navigate to **Start** > **Administrative Tools**.
   - To display the Domain Security Policy on Windows Server 2008, navigate to **Start** > **Administrative Tools** > **Group Policy Management**. In the **Group Policy Management Console**, navigate to **Forest** > **Domains** > `<DomainName>` > **Group Policy Objects**. Then right-click **Default Domain Policy** and click **Edit**.
3. In the Domain Security Policy, Password Policy is an option in the respective tree view (**Windows Settings** > **Security Settings** > **Account Policies**). Ensure that the Password Policies of the Domain Security Policy are set using the following instructions:

Make sure to remember the current settings to restore them in a later step.

- Minimum password length: 0 characters
- Password must meet complexity requirements : Disabled

4. Copy the `createADUser.ldif` and `createADUser.bat` files located in `<Interstage BPM Server Installation Directory>/client/samples/configuration` to another directory.

   If the Active Directory Server is different from the Interstage BPM Server, copy the files to the Active Directory Server.

5. To create a new user, update the copies of the `createADUser.ldif` and `createADUser.bat` files. Refer to the instructions in the files for details.
6. Ensure that the `createADUser.ldif` file is located in your current directory.
7. Execute the `createADUser.bat` batch file.
8. Restore the Password Policies if you changed them in a previous step.

10.1.4 Adding New Users Using the GUI

Note: To create users that are valid for Interstage BPM, use only alphanumeric characters, hyphens, and underscore characters ("_"). User names must not begin with an at character ("@") as this is used to identify Agents in Interstage BPM.

To add new users using the ActiveDirectory GUI:

1. Launch the Active Directory Console if you haven't already done so by selecting **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Active Directory Users and Computers**. Expand the host name and the domain name to find the **people** Organizational Unit.
2. Right click **people**.

3. From the popup menu, select **New**, and then select **User** to open the **New Object - User** dialog.

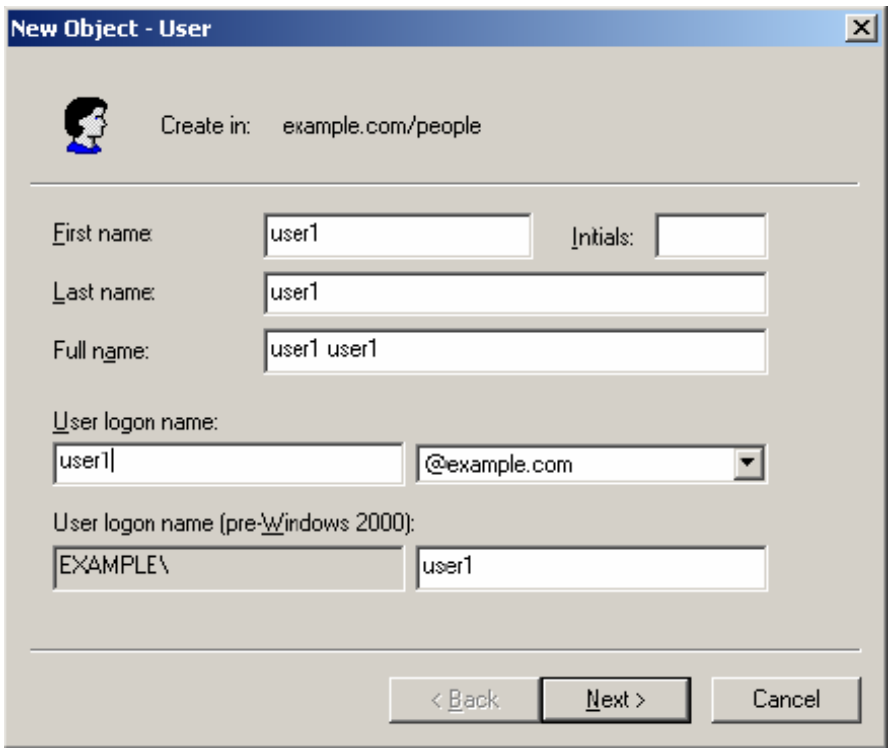

Figure 29: Adding a New User

4. Enter the new user's information and click **Next**.

   For each user, Active Directory requires you to provide a first name, last name, full name, and user login name.

   Interstage BPM requires both a user login name and password to log in.

5. Enter the user's password, and then click **Next**.

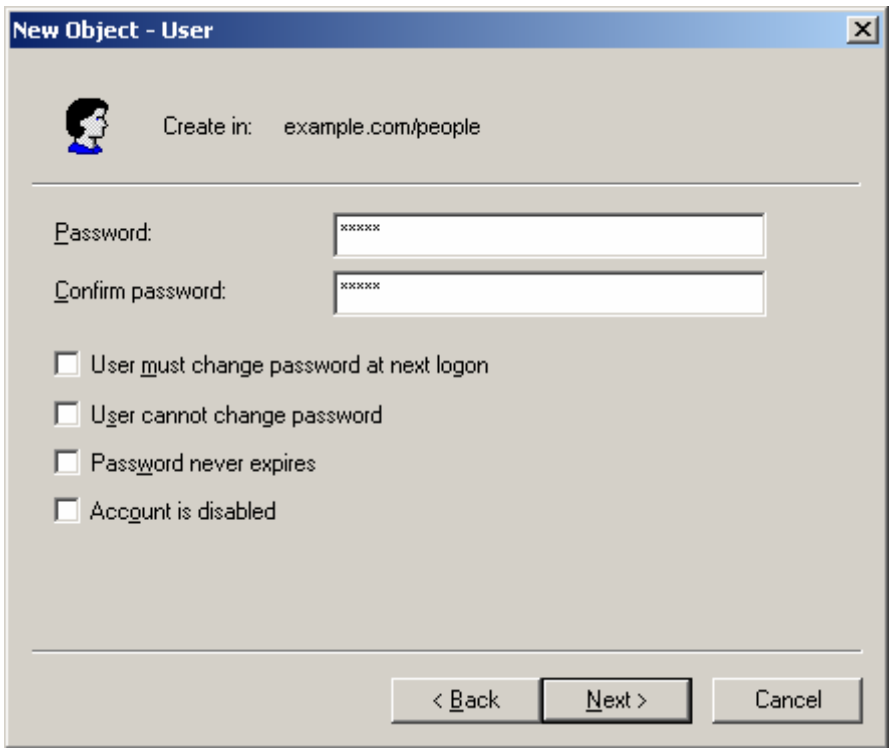

Figure 30: Adding a New User

6. Confirm the adding of the new user by clicking **Finish** in the confirmation dialog.

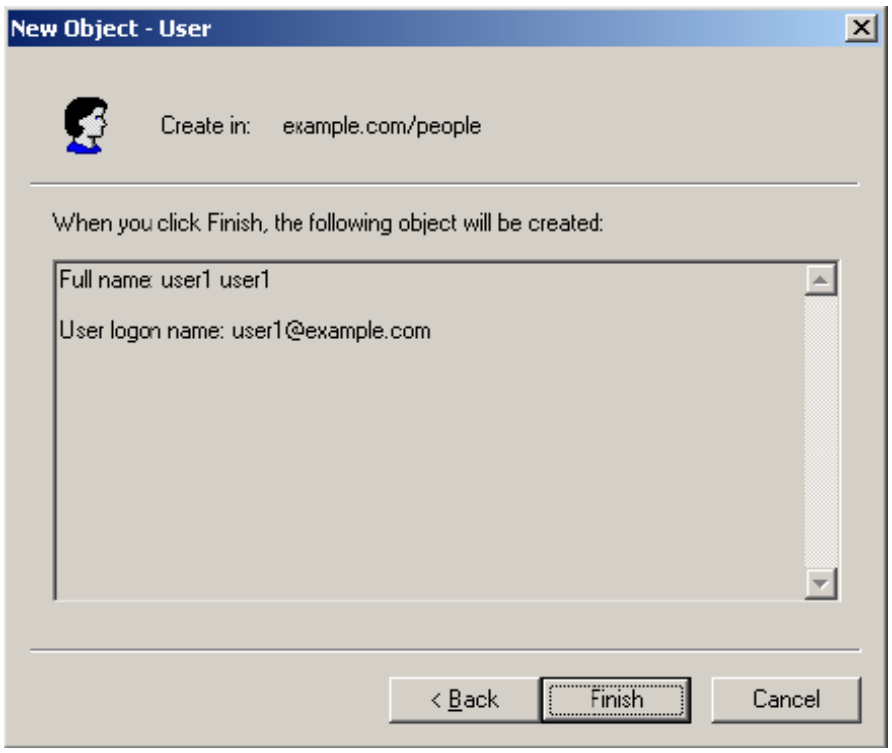

Figure 31: Adding a New User

Use the **New Object - User** dialog to create as many new user profiles as you want.

7. Add the new user to `IflowUsers` so that the new user is recognized by Interstage BPM. To do so:
   a) In the **Active Directory Users and Computers** window, expand the host name and the domain name to find the main Organizational Unit that you specified during Interstage BPM installation.
   b) Right click the `IflowUsers` Group and select **Properties** from the popup menu.
   c) Select the **Members** tab and click **Add**.
      The **Select Users, Contacts, Computers, or Groups** dialog appears.
   d) Enter the name of the new user that is to be added to `IflowUsers`. Click **Check Names** to verify the user name.
   e) Click **OK**.

10.1.5 Adding New Groups with an LDIF File

You can add new Groups to Active Directory by manually editing the LDIF file, then importing it.

To add new Groups with an LDIF File:

1. Log on as an Administrator to the computer where the Active Directory master schema is located.
2. Copy the `createADGroup.ldif` and `createADGroup.bat` files located in `<Interstage BPM Server Installation Directory>/client/samples/configuration` to another directory.

If the Active Directory Server is different from the Interstage BPM Server, copy the files to the Active Directory Server.

3. To create a new Group, update the copy of the `createADGroup.ldif` file. Refer to the instructions in this file for details.
4. Ensure that the `createADGroup.ldif` file is located in your current directory.
5. Execute the `createADGroup.bat` batch file.

10.1.6 Adding New Groups Using the GUI

Note: To create Groups that are valid for Interstage BPM, use only alphanumeric characters, hyphens, and underscore characters ("_"). Group names must not begin with an at character ("@") as this is used to identify Agents in Interstage BPM.

To add a new Group using the GUI:

1. Launch the Active Directory Console if you haven't already done so by selecting **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Active Directory Users and Computers**. Expand the host name and the domain name to find the **groups** Organizational Unit.
2. Right click **groups**.
3. From the popup menu, select **New**, and then select **Groups** to open the **New Object - Groups** dialog.
4. Add the new Group's information, and then click **OK** to add your new Group.

   In the example below, the Group `Role` is added.

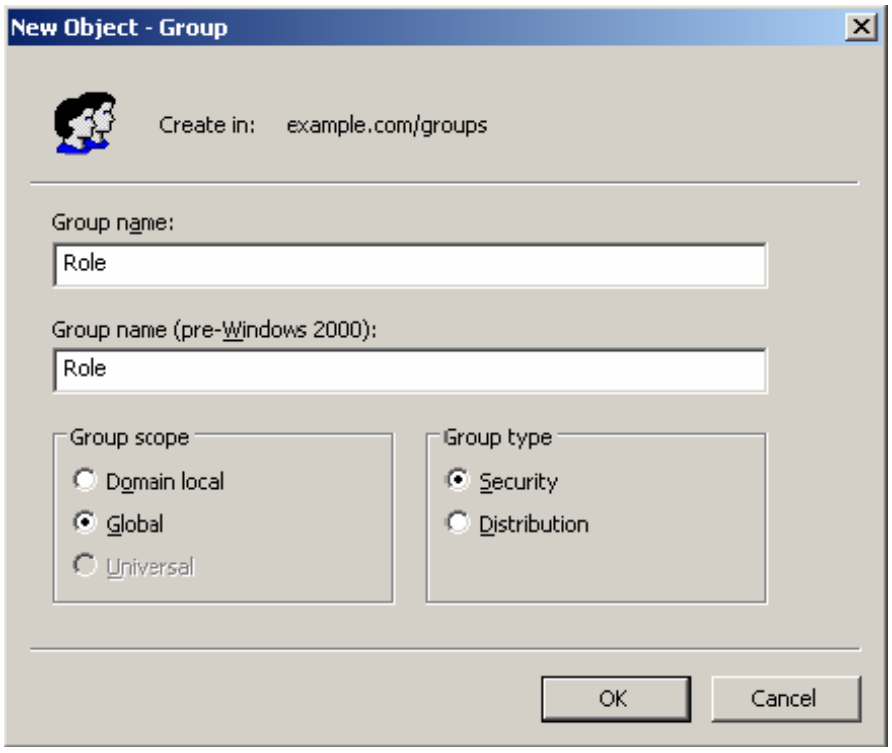

Figure 32: Adding New Groups

5. Confirm the adding of the new Group by clicking **Finish** in the confirmation dialog box.

   Use the **New Object - Groups** dialog to create as many new user profiles as you want.

   For each Group, Active Directory requires you to provide a unique name for your Group.
6. Add the new Group to `IflowGroups` so that the new Group is recognized by Interstage BPM. To do so:
   a) In the **Active Directory Users and Computers** window, expand the host name and the domain name to find the main Organizational Unit that you specified during Interstage BPM installation.
   b) Right click the `IflowGroups` Group and select **Properties** from the popup menu.
   c) Select the **Members** tab and click **Add**.

      The **Select Users, Contacts, Computers, or Groups** dialog appears.
   d) Enter the name of the new Group that is to be added to `IflowGroups`. Click **Check Names** to verify the Group name.
   e) Click **OK**.

10.1.7 Adding Members to a Group Using LDIF

The batch file `addADGrMember.bat` imports the `addADGrMember.ldif` file. The file must be available on the Active Directory master schema machine.

To add Members to a Group Using LDIF:

1. Log on as an Administrator to the computer where the Active Directory master schema is located.
2. Copy the `addADGrMember.ldif` and `addADGrMember.bat` files located in `<Interstage BPM Server Installation Directory>/client/samples/configuration` to another directory.

   If the Active Directory Server is different from the Interstage BPM Server, copy the files to the Active Directory Server.
3. To add a member to a Group, update the copy of the `addADGrMember.ldif` file. Refer to the instructions in this file for details.
4. Ensure that the `addADGrMember.ldif` file is located in your current directory.
5. Execute the `addADGrMember.bat` batch file.

10.1.8 Adding Members to a Group Using the GUI

> **Note:** After normal installation using Active Directory, the default Administrator Role is a Group called `AdminRole`. You can change this default name by modifying the `AdminRole` parameter of the Interstage BPM Server.

To add members to a Group using the GUI:

1. Launch the Active Directory Console if you haven't already done so by selecting **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Active Directory Users and Computers**. Expand the hostname and the domain name to find the **groups** Organizational Unit.
2. Right click the group to which you want to add members.
3. From the popup menu that appears select **Properties**, and then select the **Members** tab to display the Group's properties dialog.

The **Properties** dialog for the `Role` Group is used in the following example. `ibpm_example` is already a member of the `Role` Group.

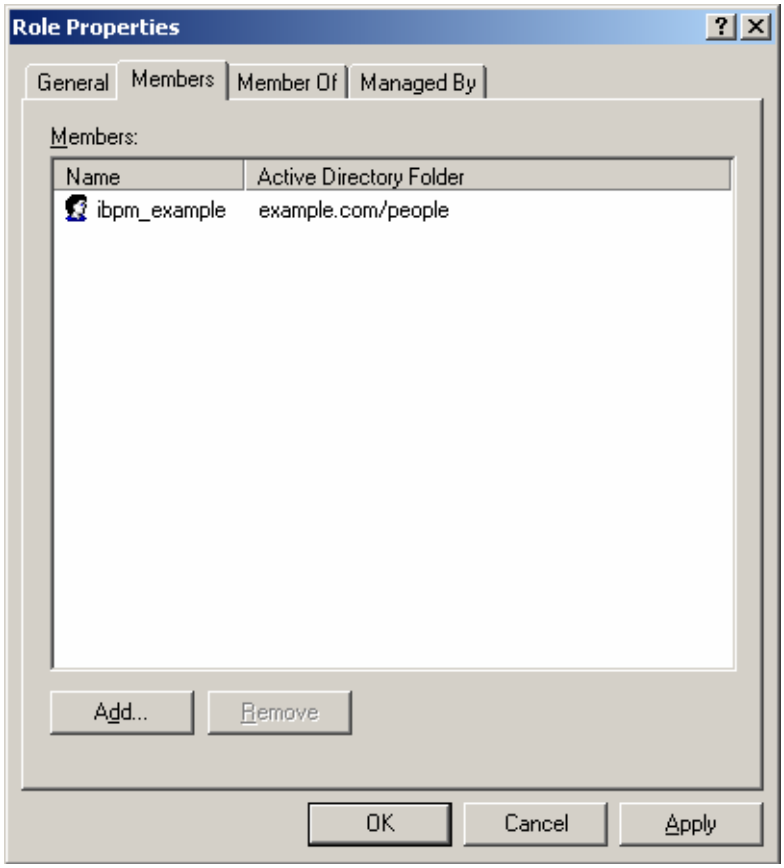

Figure 33: Adding Members

The default Group named `Role` is installed when you import the `IBPMADAdd.ldif` file. You can maintain all of your users if you like.

4. In the **Role Properties** dialog, click **Add**.

   The **Select Users, Contacts, Computers, or Groups** dialog appears.

5. In Windows® 2003 Server, search a user or Group that you want to add as a member of the Group.

The user or Group appears in the bottom text area of the dialog.

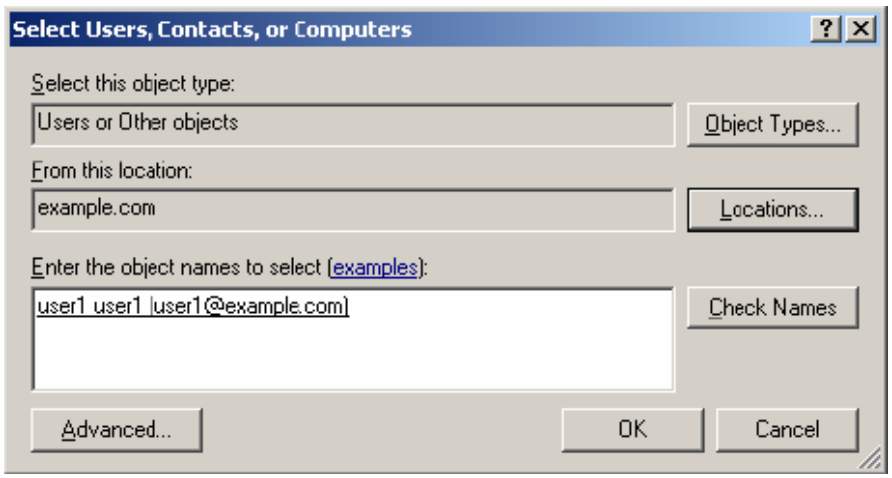

Figure 34: Selecting a User

6. Click **OK**.

The user appears with the existing users in the **Properties** dialog.

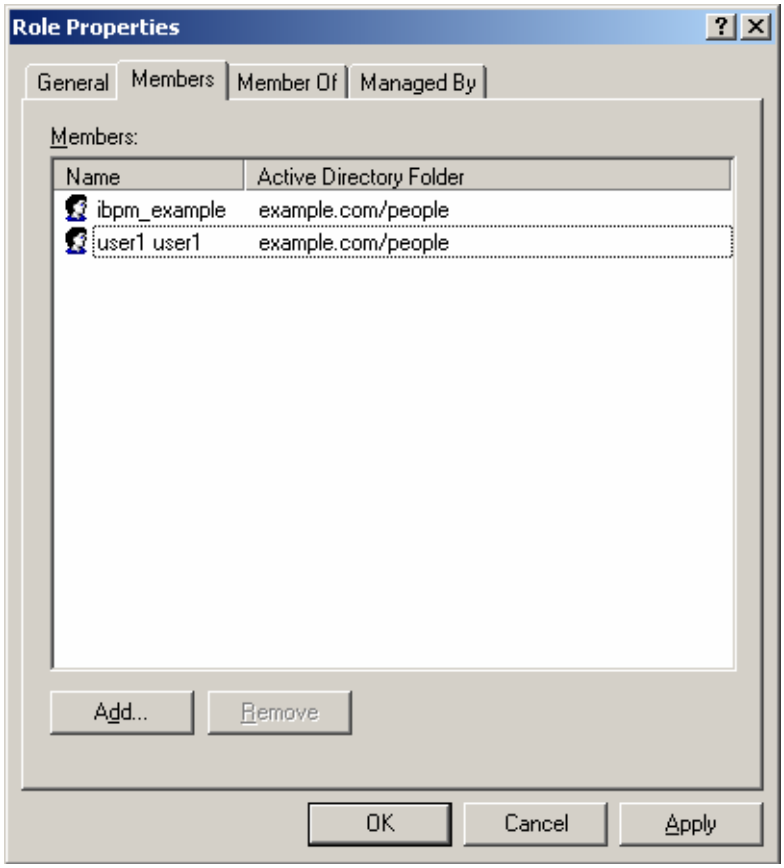

Figure 35: New Member Added

7. To the **AdminRole** Group, add the IDs of all Interstage BPM users who will create `WFAdminSession` objects through Java. This Group should at least include the Interstage BPM Administrator account that you defined during deployment.

10.2 Setting Up Sun Java System Directory Server

Sun Java System Directory Server (formerly known as iPlanet Server) uses a form of the Lightweight Directory Access Protocol (LDAP). Like all LDAP-type Directory Services, it organizes people into Groups, and maintains a user profile with the appropriate permissions for each user.

To use Interstage BPM with Sun Java System Directory Server, you must customize your Sun Java System Directory Server installation as follows:

- Start the Sun Java System Directory Server.
- Import the `IBPMLDAPAdd.ldif` file into your Sun Java System Directory Server. The `IBPMLDAPAdd.ldif` file contains the default Interstage BPM users and Groups. The `IBPMLDAPAdd.ldif` file also contains information about access permissions required to run Interstage BPM.
- Add users and Groups to the Directory Service.

10.2.1 Starting the Sun Java System Directory Server

Prerequisite:

- Install the Sun Java System Directory Server.
- Create a Directory Server Instance.

You can start the directory server using Directory Service Control Center through JavaWeb Console. By default, the URL to access Java Web Console is:

```
https://hostname:6789
```

For details, refer *Sun Java SystemDirectory Server Enterprise Edition 6.3 Installation Guide*.

10.2.2 Importing the IBPMLDAPAdd.ldif File

Prerequisites:

Create a suffix for the Directory Server Instance.

The `IBPMLDAPAdd.ldif` file contains the default Interstage BPM users and Groups. The `IBPMLDAPAdd.ldif` file also contains information about access permissions required to run Interstage BPM.

To import the `IBPMLDAPAdd.ldif` file:

1. Make sure that you have the `IBPMLDAPAdd.ldif` file in the `<Interstage BPM Server Installation Directory>/client/samples/configuration` directory.
2. Copy the `IBPMLDAPAdd.ldif` file to a computer in which the Directory Server is running.
3. Run the `ldapmodify` command on the computer in which the Directory Server is running.

   The `ldapmodify` command is typically located at: `/opt/SUNWdsee/dsee6/bin/` directory.

   ```
    ldapmodify -c -h (hostname) -p (port number of the Directory Server)
   -D (DN of an user who connect to the Directory Server) -w (password of
    the user specified with -D option) -f (location of IBPMLDAPAdd.ldif)
   ```

   For example,

   ```
    ldapmodify -c -h machineName -p 389 -D
   cn=admin,cn=Administrators,cn=config -w adminpassword -f IBPMLDAPAdd.ldif
   ```

Note: The import function, `ldapmodify` command will not overwrite existing settings. If you have imported an `IBPMLDAPAdd.ldif` file previously, duplicate settings will be detected and rejected. An appropriate message will appear.

10.2.3 Using Existing Sun Java System Directory Server Users and Groups

If you are new to Interstage BPM and are already using Sun Java System Directory Server as the Directory Service to maintain your organization's users and Groups, you can use your existing directory structure with Interstage BPM. You can do this by designating your LDAP Users as Interstage BPM users and your LDAP Groups as Interstage BPM Roles. This involves the modification of two special LDAP Groups, `IflowUsers` and `IflowGroups`.

When you imported the `IBPMLDAPAdd.ldif` file, you created two LDAP Groups under your main Organizational Unit (ou) called `IflowUsers` and `IflowGroups`. Of course, this assumes that you

specified your main organizational unit when you installed Interstage BPM. These two special LDAP Groups can be used to allow your LDAP Users and Groups access to Interstage BPM.

To give your LDAP Users access to Interstage BPM as Interstage BPM users, add them as members of the `IflowUsers` Group. You can add each user individually or add a Group that contains the users. Users in the Group sub-levels are also given access. To give your LDAP Groups access to Interstage BPM as Interstage BPM Roles, add them as members of the `IflowGroups` Group.

10.2.4 Adding New Sun Java System Directory Server Users

You can add new users by manually editing a copy of the `IBPMLDAPAdd.ldif` file or by using the Directory Service Control Center through JavaWeb Console.

Note: Do not edit the `IBPMLDAPAdd.ldif` file in the `<Interstage BPM Server Installation Directory>/client/samples/configuration` directory because it will be overwritten if you re-execute a server instance setup. Copy the file to another directory and edit the copy.

When you create new users, note the following:

1. To create users that are valid for Interstage BPM, use only alphanumeric characters, hyphens, and underscore characters ("_"). User IDs must not begin with an at character ("@") as this is used to identify Agents in Interstage BPM.
2. For each user, Sun Java System Directory Server requires you to provide a last name and common name(s). In addition, Interstage BPM requires a User ID.
3. Although entering a password and confirming it are optional for Sun Java System Directory Server, Interstage BPM requires a password to log in.
4. The other fields such as **E-Mail**, **Phone**, and **Fax** are not used by Interstage BPM.

10.2.5 Adding New Groups

You can add new Groups by manually editing a copy of the `IBPMLDAPAdd.ldif` file or by using the Directory Service Control Center through JavaWeb Console.

Note: Do not edit the `IBPMLDAPAdd.ldif` file in the `<Interstage BPM Server Installation Directory>/client/samples/configuration` directory because it will be overwritten if you re-execute a server instance setup. Copy the file to another directory and edit the copy.

When you create new groups, note the following:

1. To create Groups that are valid for Interstage BPM, use only alphanumeric characters, hyphens, and underscore characters ("_"). Group names must not begin with an at character ("@") as this is used to identify Agents in Interstage BPM.
2. Groups are known as Roles in Interstage BPM. There is a default Group named `Role` installed by Interstage BPM when you import the `IBPMLDAPAdd.ldif` file.
3. After a normal installation using the Sun Java System Directory Server, the default Administrator Group is called `AdminRole`. You can change this default name by modifying the `AdminRole` parameter of the Interstage BPM Server. For a parameter description, refer to the *Interstage Business Process Manager Server Administration Guide*. To this Group, add the IDs of all Interstage BPM users who will access administration functions in the Interstage BPM Console or create `WFAdminSession` objects through Java. This Group should at least include the Interstage BPM Administrator account that you defined during deployment (typically `ibpm_server1`).

10.3 Group Caching

When the Interstage BPM Server starts up, Interstage BPM connects to the Directory Service and copies all of the user and Group information defined in `LDAPUsersDN` and `LDAPGroupsDN` to a cache on the Interstage BPM Server. This increases Interstage BPM performance because user and Group information no longer has to be retrieved from the Directory Service, which might be running on a separate network computer. It retrieves it from the LDAP Cache that is on the local computer in memory.

If the cache is not updated, users added since the start of the Interstage BPM Server would not be able to login to or use Interstage BPM. To avoid this, the cache has to be updated periodically.

The `LDAPGroupCacheAgeSec` parameter of the Interstage BPM Server specifies how often the LDAP Cache is updated. Groups that have been in service for longer than the period of time specified in the `LDAPGroupCacheAgeSec` parameter are checked, and new user and Group information is retrieved from the Directory Service. The default value for this parameter is 3600 seconds; that is, the LDAP Cache will be checked every hour. If this parameter is set to -1, new user and Group information is retrieved from the Directory Service every time it is needed. Refer to the *Interstage Business Process Manger Server Administration Guide* for more information about the configuration parameters of the Interstage BPM Server.

Each entry in the cache has a timestamp that is set to the last time that group was read from the Directory Service. Whenever someone calls the Directory Adapter to fetch a Group, the Directory Adapter checks if that Group is in the cache:

- If the Group requested is not in the cache, it is read in and timestamped with the current time.
- If the Group requested is already in the cache, the timestamp is checked. If the Group was timestamped before the previous cache check (it is at a time before `LDAPGroupCacheAgeSec` seconds ago), then just that Group is deleted from the LDAP Cache and read back in from the Directory Service. All other Groups in the cache are unaffected.

10.4 User Attribute Caching

The generic structure of an Interstage BPM user's profile is stored using multiple user attributes. These attribute values include the user's ID, email, manager or subordinate's ID, and so on. Inclusion of manager or subordinate information in the Interstage BPM user profile allows mapping of your company’s organization and people structure so that Interstage BPM can further use this information. The `RequiredUserAttribute` property of Interstage BPM stores names of user attributes that are necessary to be defined for a user profile.

All attributes specified for `RequiredUserAttribute` are not cached. Only attributes for which the `cache` option is specified are cached. Storing attributes in the local database cache allows Interstage BPM to quickly search and retrieve these attribute values for any user, from the cache. Retrieved attribute values can further be used for different purposes (for example, directly allocating a task to a particular user's manager or subordinate, or viewing what tasks a user’s subordinates are allocated to).

Interstage BPM server refreshes the user attribute values in the cache in the following scenarios:

- When you modify the value of the `RequiredUserAttribute` Interstage BPM property
- When you call the Model API `WFAdminSession.refreshAllUserProfileCache()` method

Appendix A: Security

Interstage BPM can be set to two security levels: Demo Mode and Security Mode. Demo Mode is useful while key members of your work team learn the features of the software. Later, Security Mode provides a stable and controlled environment for implementing Interstage BPM across your company.

A.1 Interstage BPM Operation Model

It is assumed that Interstage BPM is used in an organizational Intranet. In most situations, end-users will work with Interstage BPM applications via a firewall, administrators, however, will be using the server segment.

End-users do not need to run applets or other clients requiring the Interstage BPM model. This means that the only port that needs to be opened in the firewall is the standard HTTPS port (443) and the Web Server in the server segment.

The following diagram depicts a deployment situation where Interstage BPM applications are used via a firewall. It also shows possible security threats – these are described in more detail in the subsequent table.

Interstage BPM Operation Model Diagram

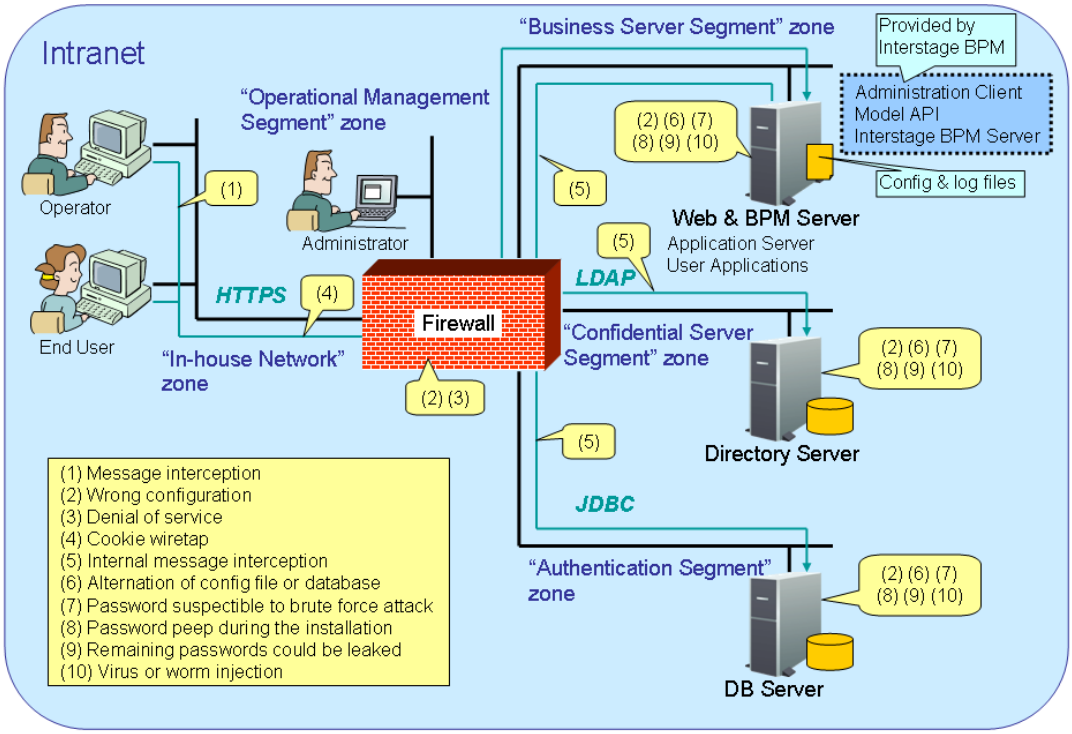

Figure 36: Interstage BPM Operation Model

The following table lists the possible security threats as well as possible solutions:

#	Threat	Solution
(1)	Message interception	Use SSL.
(2)	Wrong configuration	Make sure that your administrators are properly trained and certified, and that the firewall, the Web Server, the Interstage BPM Server, the Database Server and the Directory Server are configured correctly.
(3)	Denial of service	Use firewall configuration to block illegitimate requests.
(4)	Cookie wiretap	Use secure cookies if you are using cookies for session management.
(5)	Internal message interception	Keep the Web Server, Interstage BPM Server, the Directory Server and the Database Server machines in a secure location.
(6)	Alternation of config file or database	Keep the Web Server, Interstage BPM Server, Directory Server and Database Server machines in a secure location. Set the operating system/database permissions such that file/database access is possible only by authorized people. Take special care for the directories/database of Interstage BPM, Interstage Application Server, Active Directory and Oracle.
(7)	Password suspectible to brute force attack	All guessed passwords should be changed to something that is less vulnerable. Passwords should not be proper nouns (e.g., a person's name), a word found in a dictionary or the same string as the user name. Ideally, a password should contain a minumum of 6 characters in a mixture of upper case, lower case, numeric digits and other characters. In addition, it should not contain more than two identical consecutive characters and more than two ascending or descending consecutive characters.
(8)	Password peep during the installation	Install under the condition that no one is around you.
(9)	Remaining passwords could be leaked	Secure the files created by the Deployment Tool instantly after the deployment. For a list of files, refer to section *Password Protection* on page 56.
(10)	Virus or worm injection	As a rule, always use anti-virus software.

A.2 Password Encryption

The Interstage BPM Deployment Tool encrypts the passwords entered during deployment and writes the encrypted passwords into the database. The `ibpm.properties` file, which is generated by the Deployment Tool as a backup copy of the initial configuration, also contains encrypted passwords only.

The Interstage BPM Server decrypts all passwords at startup. If decryption fails, a warning message is printed in the `IBPMServer.log` file.

If you need to change the user/passwords after deployment, an Encryption Utility is provided so that you can encrypt the passwords and overwrite them in the server's configuration. The Encryption Utility does not provide for decryption of passwords. It can only be used for encryption.

Initially, a default key is used to encrypt and decrypt the passwords. If you want to use a different key for security reasons, you must add this key to the server's configuration. The default key is not published; it is hardcoded in the server code.

The Encryption Utility provided is:

`com.fujitsu.iflow.utilities.TextEncrypter.class`

To call the Encryption Utility, use the encryption script located in `<Interstage BPM Server Installation Directory>/client/samples/configuration`:

- On Windows: `EncryptPassword.bat`
- On Solaris: `EncryptPassword.sh`
- On Linux: `EncryptPassword.sh`

Encrypting a Password With the Default Key

To encrypt a password with the default key, run the script with the following option:

On Windows: `EncryptPassword.bat -e "<TextPassword>"`

On Solaris: `EncryptPassword.sh -e "<TextPassword>"`

On Linux: `EncryptPassword.sh -e "<TextPassword>"`

Note: Make sure to enclose the password and the encryption key in double quotes. Otherwise, the encryption process might fail. As double quotes are delimiters, do not use double quotes in the encryption key.

Encrypting Passwords With a New Key

You are recommended to encrypt your passwords with your own key.

To encrypt a single password with a new key, run the script with the following options:

On Windows: `EncryptPassword.bat -e "<TextPassword>" "<Key>"`

On Solaris: `EncryptPassword.sh -e "<TextPassword>" "<Key>"`

On Linux: `EncryptPassword.sh -e "<TextPassword>" "<Key>"`

Note: If a key other than the default key is used, it should contain more than 24 characters.

Make sure to enclose the password and the encryption key in double quotes. Otherwise, the encryption process might fail. As double quotes are delimiters, do not use double quotes in the encryption key.

During startup of the Interstage BPM Server, the key needs to be present in the server's configuration. Therefore, before starting the server, use the configuration export and import scripts to add the following parameter to the server's configuration:

`EncryptionKey=<Key>`

For details on the procedure, refer to section *Using the Configuration Export and Import Scripts* on page 100. For security reasons, the key can be removed again from the configuration file that you imported into the database.

Alternatively, you can encrypt all passwords in the configuration file at the same time before importing it into the database. To do this, substitute all passwords in the configuration file with actual text passwords and encrypt the configuration file by running the script with the following options:

On Windows: `EncryptPassword.bat -f "<Path of Configuration File>" "<Key>"`

On Solaris: `EncryptPassword.sh -f "<Path of Configuration File>" "<Key>"`

On Linux: `EncryptPassword.sh -f "<Path of Configuration File>" "<Key>"`

Note: Make sure to enclose the file path and the encryption key in double quotes. Otherwise, the encryption process might fail. As double quotes are delimiters, do not use double quotes in the encryption key.

The following parameters in the configuration file are encrypted using this method:

- `DBALoginpassword`
- `LDAPAccessUserPassword`
- `MetadataRepositoryPassword`
- `ServerPassword`
- `SMTPPassword`
- `SWAPLinkagePassword`
- `UDDIPublisherPassword`

Example

Use the following command to encrypt all passwords in the configuration file at the same time.

On Windows: `EncryptPassword.bat -f "C:\SomeDirectory\MyServerConfiguration.properties" "EWAERJQ23FIQ0J22"`

On Solaris: `EncryptPassword.sh -f "/SomeDirectory/MyServerConfiguration.properties" "EWAERJQ23FIQ0J22"`

On Linux: `EncryptPassword.sh -f "/SomeDirectory/MyServerConfiguration.properties" "EWAERJQ23FIQ0J22"`

A.3 Using Demo Mode and Security Mode

Interstage BPM can be set to two security levels: Demo Mode and Security Mode. Demo Mode is useful while key members of your work team learn the features of the software. Later, Security Mode provides a stable and controlled environment for implementing Interstage BPM across your company.

Demo Mode restricts access to Interstage BPM in two ways:

- Only the person who is assigned a work item may make choices about it, thus advancing the process to the next work item - or completing it.
- Only members of the `AdminRole` can access administration functions in the Interstage BPM Console.

All Interstage BPM users can experiment with all of Interstage BPM functions, including creating and editing process definitions and process instances.

In **Security Mode**, access to process definitions, process instances, and work items are restricted to the specific people who need to use them. The following are examples of people who need to use them:

- Only members of the Role specified in the `TemplatePublishers` parameter of the Interstage BPM Server can create new process definitions.
- Only the process instance owners, current assignees, and Interstage BPM Administrators can view any specific process instances. (Current assignees are those who have active task assignments. This does not include people who will have task assignments later in the process.)

- Only the process instance owners, current assignees, and Interstage BPM Administrative Users can edit their specific process instances. This means they can change User Defined Attributes and add or delete attachments. However, they are not allowed to edit the process structure.

To set up Security Mode:

- Add the following parameters to the server configuration:

  `SecuritySwitch=true`

  This setting enables Security Mode.

  `TemplatePublishers =<Registered Role>`

  This Role must be registered in Interstage BPM's local group store or in your Directory Service. For example, if you have defined a Role of `pubRole`, you would type `TemplatePublishers=pubRole`. Be aware that this key takes effect only if the Security Mode is switched on.

  For information on how to add parameters, refer to section *Using the Configuration Export and Import Scripts* on page 100.

A.4 Configuring SMTP Authentication for Use with Interstage BPM

Note: Only a System Administrator should perform these instructions.

If you required SMTP Authentication for logging in to Interstage BPM, use the following instructions:

1. Set up an email server and enable SMTP Authentication.
2. Add the following parameters to the server configuration:

   `SMTPServerHost=<Email Server Host Name>`

   `SMTPUserName=<User Name for SMTP Authentication>`

   `SMTPPassword=<Password for SMTP authentication>`

   For details on the procedure, refer to section *Using the Configuration Export and Import Scripts* on page 100.

3. Design a process definition to test the email feature.

   Refer to the *Interstage Business Process Manager Studio User's Guide* for information on how to design process definitions.

If the `SMTPUserName` or `SMTPPassword` are set correctly, the email will be accepted by the email server. If neither the `SMTPUserName` nor `SMTPPassword` values are blank, Interstage BPM will use the SMTP authentication feature.

A.5 Using the Configuration Export and Import Scripts

Prerequisite: The database server is running.

Interstage BPM comes with configuration export and import scripts that allow you to change the server configuration. You can use these scripts to add parameters that are not present in the configuration or remove parameters from the configuration. If the server fails to start or denies login due to configuration errors, you can use the scripts to import a working configuration into the database.

You can add or edit both System as well as Tenant properties using the export and import scripts. For more information about System and Tenant properties, refer the *Interstage BPM Server Administration Guide.*

The Interstage BPM Server is not required to be running for the configuration export and import scripts to be used.

To use the configuration export and import scripts:

1. Export the server configuration by running the export script located in `<Interstage BPM Server Installation Directory>/server/deployment/bin`:

Operating System	Configuration Export Script

Windows	• For System Properties:
	`exportProperties.bat <File Name> <Database User Name> <Password>`
	Example:
	`exportProperties.bat MyServerConfiguration.properties SomeUserName SomePassword`
	• For Tenant Properties:
	`exportProperties.bat <File Name> <Database User Name> <Password> <TenantName>`
	Note that `<TenantName>` is case-sensitive.
	Example:
	`exportProperties.bat MyServerConfiguration.properties SomeUserName SomePassword Default`

Solaris
Linux
	• For System Properties:
	`exportProperties.sh <File Name> <Database User Name> <Password>`
	Example:
	`exportProperties.sh MyServerConfiguration.properties SomeUserName SomePassword`
	• For Tenant Properties:
	`exportProperties.sh <File Name> <Database User Name> <Password> <TenantName>`
	Note that `<TenantName>` is case-sensitive.
	Example:
	`exportProperties.sh MyServerConfiguration.properties SomeUserName SomePassword Default`

For `<File Name>`, specify the file name and, optionally, the path of the configuration file to be generated. If you do not specify a path, the configuration file is written to the current directory.

For `<Database User Name>` and `<Password>`, specify the database user account that you defined during deployment of the Interstage BPM Server.

Note: Before you make any changes to the Server configuration, make a copy of the server configuration file you exported as a back-up. In case you make errors while editing parameters, Interstage BPM Server may not be able to start or errors may occur at runtime. In such a case you can import the back-up file which contains a working configuration.

2. Make the required changes in the generated configuration file.

   If you want to add parameters, use the following syntax:

   ```
   <Parameter Name>=<Parameter Value>
   ```

Note:

- Parameter names and values are case sensitive.
- Any backslashes "\" or colons ":" used in parameter values must be escaped by backslashes. For example, a server address is specified like this:

  ```
  ibpmhost\:49950
  ```

- Be careful with any configuration changes. If you specify invalid values, the Interstage BPM Server may not be able to start or errors may occur at runtime.
- Some configuration parameters have a `<Hostname>` or `<Hostname>.<Servername>` suffix appended to their names. These suffixes are automatically removed during the export and are automatically appended during the import. Do not add these suffixes to the parameter names.

   Passwords in the generated configuration file are encrypted for security reasons. If you change a password, you are recommended to encrypt it before importing the configuration file. Passwords are not automatically encrypted during the import. For details on how to encrypt passwords, refer to section *Password Encryption* on page 97.

3. Import the updated configuration file into the database by running the import script located in `<Interstage BPM Server Installation Directory>/server/deployment/bin`:

Operating System	Configuration Import Script

Windows	• For System Properties:
	`importProperties.bat <File Name> <Database User Name> <Password>`
	Example:
	`importProperties.bat MyServerConfiguration.properties SomeUserName SomePassword`
	• For Tenant Properties:
	`importProperties.bat <File Name> <Database User Name> <Password> <TenantName>`
	Note that `<TenantName>` is case-sensitive.
	Example:
	`importProperties.bat MyServerConfiguration.properties SomeUserName SomePassword Default`

Solaris
Linux
	• For System Properties:
	`importProperties.sh <File Name> <Database User Name> <Password>`
	Example:
	`importProperties.sh MyServerConfiguration.properties SomeUserName SomePassword`
	• For Tenant Properties:
	`importProperties.sh <File Name> <Database User Name> <Password> <TenantName>`
	Note that `<TenantName>` is case-sensitive.
	Example:
	`importProperties.sh MyServerConfiguration.properties SomeUserName SomePassword Default`

For `<File Name>`, specify the file name and, if required, the path of the updated configuration file. You need to specify the path if the configuration file is not located in the current directory.

For `<Database User Name>` and `<Password>`, specify the database user account that you defined during deployment of the Interstage BPM Server.

4. In a cluster installation, each server node must be configured individually. Therefore, repeat steps 1-3 for the other server nodes.
5. Restart the Interstage BPM Server for the changes to take effect.

Appendix B: Silent Mode Installation

A Silent Mode installation is a non-interactive type of installation, i.e. you start the installation program and Interstage BPM is installed. If you have to perform multiple installations of Interstage BPM, and the installations are essentially the same, you might want to consider installing Interstage BPM in Silent Mode as you can save a significant amount of time.

How It Works

Silent Mode installations involve the use of an installation script. You perform the first installation interactively using a special installation option that records the installation into an installation script in ASCII (text) format. You then run subsequent installations in silent mode using this script. Minor installation variations can be handled by editing the script.

B.1 Setting Up a Silent Mode Installation of Interstage BPM

To set up a Silent Mode Installation:

1. Create a new directory on your computer.
2. Copy the following files from the `engine` directory on your CD-ROM to the directory that you created on your computer:
   - `setup.jar`
   - `setupwin32.exe` on Windows
   - `setupSolaris.bin` on Solaris
   - `setupLinux.bin` on Linux
3. Open a Command Prompt window and navigate to the directory on your computer containing the copied files.
4. Start the installation program for Interstage BPM by entering the following command:

   On Windows:

   ```
   setupwin32.exe /r /f1"<Absolute Installation Script Path>\<Installation Script Name>"
   ```

   In the following example, `RMI` is the directory containing the copied files and `record-install.iss` is the name of the installation script to be recorded:

   ```
   C:\RMI> setupwin32.exe /r /f1"C:\RMI\record-install.iss"
   ```

   Note: The installation script for Windows is created in a `.iss` (and not `.txt`) file.

   On Solaris:

   ```
   ./setupSolaris.bin -options-record <Installation Script>
   ```

   In the following example, `RMI` is the directory containing the copied files and `record-install.txt` is the name of the installation script to be recorded:

   ```
   /RMI> ./setupSolaris.bin -options-record record-install.txt
   ```

   On Linux:

   ```
   /RMI> ./setupLinux.bin -options-record record-install.txt
   ```

Note: If you receive an error while launching the installation program on Linux, download the `libXp-1.0.0-8.i386.rpm` package from your Red Hat Enterprise Linux CD or the Red Hat Network website and install the package using the `rpm -i libXp-1.0.0-8.i386.rpm` command. Then, retry starting the Interstage BPM installation program for Linux.

This command starts a normal mode installation of Interstage BPM and records the installation choices that you make. As the installation program runs, use the instructions in chapter *Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server* on page 23.

At the end of installation, the installation choices are written to the installation script. In the example, the installation script `record-install.txt` (`record-install.iss` for Windows) is created in the `RMI` directory. You can now use the installation script to install Interstage BPM on other computers in Silent Mode.

B.2 Installing Interstage BPM in Silent Mode

Prerequisite: You have set up your Silent Mode installation as instructed in section *Setting Up a Silent Mode Installation of Interstage BPM* on page 104.

To install Interstage BPM using Silent Mode:

1. Create a directory on the computer where you want to install Interstage BPM in Silent Mode. In the example below, `RMI` is used as the directory's name.
2. Copy the following files from the computer where you recorded the installation script to the directory that you created in the previous step:
   - the installation script that you recorded, e.g. `record-install.txt`
   - `setup.jar`
   - `setupwin32.exe` on Windows
   - `setupSolaris.bin` on Solaris
   - `setupLinux.bin` on Linux
3. Make a note of the drive and directory to which you copied the files.
4. Open the installation script in a text editor and make any changes necessary to make it run properly in the different environment. Refer to section *Silent Mode Installation Options* on page 106 for allowed changes.

   For example, you might have your J2SE Development Kit (JDK) installed on a different drive and in a different directory than on the computer where you recorded the installation script. You must search for that path and change it to the path used by the computer on which you are running the silent mode installation.
5. Save the changes made to your installation script.
6. Open a Command Prompt window and navigate to the directory that contains the installation script.
7. Install Interstage BPM in Silent Mode with the following command:

   On Windows:

   ```
   C:\RMI> <Absolute Path>\setupwin32.exe /s /f1"<Absolute Installation Script
   Path>\<Installation Script Name>" /f2"<Absolute Installation Log File
   Path>\<Installation Log File Name>"
   ```

   On Solaris:

```
/RMI> ./setupSolaris.bin -options "<Absolute Path>/record-install.txt" -silent
```

On Linux:

```
/RMI> ./setupLinux.bin -options "<Absolute Path>/record-install.txt" -silent
```

This procedure can be repeated for all of your Interstage BPM installations.

B.3 Silent Mode Installation Options

The Silent Mode installation script is a text file that you record while performing the first installation.

Note: Only use the installation script for the type of installation that you recorded. Do not add or delete parameters. Otherwise, your installation script might not work properly.

You can customize the installation script to make it run properly in a different environment. For example, you might have your J2SE Development Kit (JDK) installed on a different drive and in a different directory than on the computer where you recorded the installation script.

Parameter Description

The following table lists the parameters that occur in the installation script. All parameter values have to be enclosed in double quotes. A short description of the parameters is also provided. For detailed information about the parameters, refer to section *Installing Interstage BPM* on page 31.

Parameter Name	Sample Value	Description
On Windows: `szDir` (located below `SdAskDestPath2`) On Solaris: `-W bean1.destinationPath` On Linux: `-W bean1.destinationPath`	On Windows: `"C:\Fujitsu\InterstageBPM"` On Solaris: `"/opt/FJSVibpm"` On Linux: `"/opt/FJSVibpm"`	Absolute path to the installation directory of the Interstage BPM.
On Windows: `szDir` (located below `SelectDir`) On Solaris: `-W bean11.jdkHome` On Linux: `-W bean11.jdkHome`	On Windows: `"C:\j2sdk"` On Solaris: `"/usr/java"` On Linux: `"/usr/java"`	Absolute path to the top-level directory of the J2SE Development Kit (JDK) installation. Alternatively, the path to a Java Runtime Environment (JRE) installation can be provided.

Parameter Name	Sample Value	Description
On Windows: this parameter does not exist for this platform On Solaris: `-W bean2223.deploymenttool` On Linux: `-W bean2223.deploymenttool`	`""`	Specifies whether the installation program launches the Deployment Tool in graphical mode at the end of installation. `"A"`: The installation program launches the Deployment Tool in graphical mode. This option does not make sense when running a silent mode installation because it requires some user interaction after installation. `""`: The installation program does not launch the Deployment Tool. Like the installation program, the Deployment Tool can be run in Silent Mode. For details, refer to appendix *Silent Mode Deployment* on page 108.

Example

The following sample script performs a new installation of the Interstage BPM without launching the Deployment Tool at the end of installation.

Sample script for

- Solaris
- Linux

```
-W bean1.destinationPath="opt/FJSVibpm"
-W bean11.jdkHome="/usr/java"
-W bean2223.deploymenttool=""
```

Appendix C: Silent Mode Deployment

Like the installation program, the Deployment Tool can be run in Silent Mode. Silent Mode deployment allows you to configure the database and deploy or undeploy Interstage BPM Server without user interaction. This is an efficient way to perform multiple deployments if the deployments are essentially the same.

Silent Mode deployments require the use of a Silent Mode script. You perform an interactive deployment using a special option that records your choices into a Silent Mode script. You then run subsequent deployments in Silent Mode using this script. Minor deployment variations can be handled by editing the script.

C.1 Setting Up Silent Mode Operation

To set up a Silent Mode operation:

1. Start the Deployment Tool.
2. Walk through the configuration steps until you reach the **Review Information** screen. On that screen, select **Generate properties file for silent operation mode**.
3. Click **Finish** to start the selected operation.

   Your configuration choices are written to a Silent Mode script named `silent_<Date>`. The script is located in `<Interstage BPM Server Installation Directory>/server/deployment/resources`.

Note: It is recommended you rename the Silent Mode script because it will be overwritten if you regenerate it.

You can now use the script to perform the recorded operations on other computers in Silent Mode.

C.2 Running Silent Mode Operations

Prerequisite: You have created a Silent Mode script as instructed in section *Setting Up Silent Mode Operation* on page 108.

To run the Deployment Tool in Silent Mode:

1. Install Interstage BPM on the computer where you want to run the Deployment Tool in Silent Mode.
2. Copy the Silent Mode script that you recorded to the computer where you want to run the Deployment Tool in Silent Mode.

   You can copy the script to a directory of your choice.
3. Open the Silent Mode script in a text editor and make any changes necessary to make it run properly in the different environment. Refer to section *Silent Mode Deployment Options* on page 109 for allowed changes.

   For example, you might have your database installed on a different drive and in a different directory than on the computer where you recorded the script. You must search for that path and change it to the path used by the computer on which you are running the silent mode deployment.
4. Open a Command Prompt window and navigate to the directory `<Interstage BPM Server Installation Directory>/server/deployment/tool`.
5. Execute the following command:

On Windows:

```
run_Windows.bat -silentmode <Silent Mode Script>
```

On Solaris:

```
./run_solaris.sh -silentmode <Silent Mode Script>
```

On Linux:

```
./run_linux.sh -silentmode <Silent Mode Script>
```

For `<Silent Mode Script>`, specify the absolute path of your script.

C.3 Silent Mode Deployment Options

The Silent Mode script is a text file that you record while running the Deployment Tool in interactive mode. The contents of the Silent Mode script depends on the type of operation that you record. There are different types of operations; each type has its own set of parameters:

- Server/Console instance setup without configuring the database
- Server/Console instance setup including database configuration
- Database setup
- Server instance removal

For each type of operation, there are additional variations depending on the application server, database and Directory Service you are using.

Note: Only use the Silent Mode script for the type of operation that you recorded.

You can customize the script to make it run properly in a different environment. For example, you might have your database installed on a different drive and in a different directory than on the computer where you recorded the script.

The following tables list the parameters that you may change in the script. A short description of the parameters is also provided. For detailed information about the parameters, refer to chapter *Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server* on page 23.

Note:
- Only change parameters that are described below. Do not change any other parameters. Do not not add or delete parameters. Otherwise, your script might not work properly.
- Any backslashes "\", colons ":" or equal signs "=" used in parameter values must be escaped by backslashes. For example, a server address is specified like this:
  `ibpmhost\:49950`

WebSphere Application Server Parameters

Parameter	Sample Value (without spaces)	Description

`websphere_profilehome`	On Windows:
	`C\:\\IBM\\WebSphere \\AppServer\\profiles\\AppSrv01`
	On Solaris:
	`/opt/IBM/WebSphere/ AppServer\profiles\AppSrv01`
	On Linux:
	`/opt/IBM/WebSphere/ AppServer\profiles\AppSrv01`
		Absolute path to the root directory of the WebSphere Application Server profile.

`websphere_cellname`	`ibpmhostNode01Cell`	Name of an existing WebSphere cell.
`websphere_nodename`	`ibpmhostNode01`	Name of an existing WebSphere node.
`websphere_serverinnode`	`server1`	Name of the Interstage BPM Server.
`webspherewizard_securityenabled_ uname`	`adminusername`	User name of the administrator for your WebSphere Application Server. This parameter only appears if you selected **Security Enabled** on the **WebSphere <Version> Application Server Configuration** screen.
`webspherewizard_securityenabled_ passwd`	`adminpassword`	Password of the user specified in `webspherewizard_securityenabled_ uname`. This parameter only appears if you selected **Security Enabled** on the **WebSphere <Version> Application Server Configuration** screen.

Parameter	Sample Value (without spaces)	Description
as_javahome	On Windows: C\:\\IBM\\WebSphere\\AppServer\\java On Solaris: /usr/IBM/WebSphere/AppServer/java On Linux: /usr/IBM/WebSphere/AppServer/java	Absolute path to the top-level directory of the J2SE Development Kit (JDK) or Java Runtime Environment (JRE) installation.
ConsoleWARPath	On Windows: C\:\\Fujitsu\InterstageBPM\client\console.war On Linux: /opt/FJSVibpm/client/console.war	The path to the console application folder.

Interstage BPM Console Parameters

Parameter	Sample Value (without spaces)	Description
consoleconfignamingprovider	com.ibm. websphere.naming. WsnInitialContextFactory	Naming Provider
consoleconfiguseragentservicename	iFlow/ejb/ UserAgentService	User Agent Service Name
consoleconfighostname	itl-hw-132024	Host Name of the machine on which you deploy Console
consoleconfignamingproviderurl	iiop://itl-hw-132024	Naming provider URL for the application
ServerEmailBaseURL	http://docone: 49950/console/	Server Email Base URL; changing this value will make all of your Client-related URLs correct with regard to the Console
ServerBaseURL	http://docone: 49950/console/	Server Base URL; changing this value will make all of your Client-related URLs correct with regard to the Console Web Services

Database Parameters – Microsoft SQL Server

Parameter	Sample Value (without spaces)	Description
db_ibpmusername	ibpmuser	User name for a non-administrative database user account.
db_ibpmpassword	ibpmuserpassword	Password for the non-administrative database user account.
sqlDB_dbVersion	false	Parameter to choose version of Microsoft SQL Server. • Set this to true for Microsoft SQL Server 2005 • Set this to false for Microsoft SQL Server 2008
sql_dbinstance		Database instance of Microsoft SQL Server to be used. The default instance is represented by a blank value.
db_port	1433	Port on which Microsoft SQL Server is running.
sql_dbadminpassword	adminpassword	Password for the administrative database user account.
db_driverclassname	com.microsoft. sqlserver. jdbc.SQLServerDriver	Full package name of the JDBC driver class used to create the database connection.
db_connectionurl	jdbc\: sqlserver\://localhost\: 1433;databaseName\=teamflowdb	URL of the database to connect to.
db_jdbclibrarypath	C\:\\ MicrosoftSQLServer 2005JDBCDriver \\sqljdbc_1.2\\enu\sqljdbc.jar	Absolute path of the JDBC driver sqljdbc.jar.
db_databasehome	C\:\\Program Files\ \Microsoft SQL Server	Absolute path to the top-level directory of your Microsoft SQL Server installation.
sql_dbdatafilesdir	C\:\\Program Files\ \Microsoft SQL Server\ \MSSQL.1\\MSSQL\\Data	Absolute path to the directory where the Interstage BPM database resides.
db_javahome	C\:\\Java\\jdk5	Absolute path to the top-level directory of your JDK or JRE installation.

Database Parameters – Oracle

Parameter	Sample Value (without spaces)	Description
db_ibpmusername	ibpmuser	User name for a non-administrative database user account.
db_ibpmpassword	ibpmuserpassword	Password for the non-administrative database user account.
db_host	localhost	Name of the computer on which Oracle is installed.
oracle_sid	orcl	Connection identifier for the Oracle database.
db_port	1521	Port number of the database
oracle_dbadminpassword	oracleadminpassword	Password of the SYSTEM user.
db_driverclassname	oracle.jdbc.driver.OracleDriver	Full package name of the JDBC driver class used to create the database connection.
db_connectionurl	jdbc\:oracle\:thin\:@localhost\: 1521\:ORCL	URL of the Oracle database to connect to.
db_jdbclibrarypath	On Windows: C\:/oracle/product/10.2.0/db_1/jdbc/lib/ojdbc14.jar On Solaris: /opt/oracle/product/10.2.0/db_1/jdbc/lib/ojdbc14.jar On Linux: /opt/oracle/product/10.2.0/db_1/jdbc/lib/ojdbc14.jar	Absolute path of the Oracle JDBC driver (ojdbc14.jar for Oracle 10g, ojdbc5.jar for Oracle 11g)
db_databasehome	On Windows: C\:/oracle/product/10.2.0/db_1 On Solaris: /opt/oracle/product/10.2.0/db_1 On Linux: opt/oracle/product/10.2.0/db_1	Absolute path to the top-level directory of your Oracle installation.

Parameter	Sample Value (without spaces)	Description
oracle_dbdatafilelocation	On Windows: C\:/ oracle/product/10.2.0/db_1/ database On Solaris: /opt/ oracle/product/10.2.0/ db_1/database On Linux: /opt/oracle/product/10.2.0/ db_1/database	Absolute path to the directory where the Interstage BPM database resides.
db_javahome	On Windows: C\:/ j2sdk On Solaris: /usr/ java On Linux: /usr/ java	Absolute path to the top-level directory of your JDK or JRE installation.

Interstage BPM System Administrator (Super User)

Parameter	Sample Value (without spaces)	Description
systemadminuser	ibpm_admin	User name of the Interstage BPM System Administrator (Super User)
systemadminpassword	ibpm_adminpassword	Password of the Interstage BPM System Administrator (Super User)

Interstage BPM SaaS Mode Selection

Parameter	Sample Value (without spaces)	Description
MultiTenancyMode_SAAS	true	Boolean string value (true or false) to select or de-select the SaaS mode. Ensure this value is always opposite that of the MultiTenancyMode_Non-SAAS parameter.
CreateDefaultTenant_SAAS	true	Boolean string value (true or false) to select or de-select creation of the default tenant.

Parameter	Sample Value (without spaces)	Description
MultiTenancyMode_Non-SAAS	false	Boolean string value (true or false) to select or de-select the non-SaaS mode. Ensure this value is always opposite that of the MultiTenancyMode_SAAS parameter.

Directory Service Parameters

Parameter	Sample Value	Description
LDAPServer	myhost	Host name or IP address of the computer hosting the Directory Service.
LDAPDBSuffix	dc\=fujitsu, dc\=com	Directory Service Key.
LDAPGroups	ou\=Groups	Directory Service Organizational Unit.
LDAPPort	389	Directory Service port.

Interstage BPM Tenant Owner

Parameter	Sample Value (without spaces)	Description
LDAPAccessUserID	ibpm_server1	User name of Tenant Owner of the default tenant.
LDAPAccessUserPassword	ibpm_server1password	Password of Tenant Owner of the default tenant.

Other Settings

Parameter	Sample Value	Description
SMTPUserName	mailhost	Host name of SMTP server (mail server).
MetadataRepositoryURL	http\://localhost \:53305/CentraSite/ CentraSite/ino\:dav/ino\:dav /projects	URL of the repository to which metadata will be published.
MetadataRepositoryUserName	RepositoryAdministrator	Name of the user used for publishing metadata.

Parameter	Sample Value	Description
MetadataRepositoryPassword	RepositoryAdminPassword	Password of the user specified in MetadataRepositoryUserName.
UDDIBusinessName	MyCompany	Name of the organization that is publishing process definition information to the UDDI registry.
UDDIPublishURL	http\://localhost\:53307/UddiRegistry/publish	URL of the UDDI registry to which process definition information will be published.
UDDIPublisherUserName	RegistryAdministrator	Name of the user used for publishing UDDI registry information.
UDDIPublisherPassword	RegistryAdminPassword	Password of the user specified in UDDIPublisherUserName.
UDDIInquiryURL	http\://localhost\:53307/UddiRegistry/inquiry	URL of the UDDI registry used for searching.

Appendix D: Clustering, Load Balancing, and Failover

This appendix provides you with an effective means of increasing the scalability and reliability of your Interstage Business Process Manager system. Configuring your system for load balancing can increase scalability. Configuring your system for failover can increase reliability.

This appendix provides guidelines for setting up a cluster of Interstage BPM Servers. It also provides guidelines for configuring that cluster for load balancing and failover.

In an Interstage BPM Cluster, multiple Interstage BPM Servers are deployed to work in concert with each other. In other words, they work together as a unit. The default Interstage BPM Cluster is configured for load balancing in a round-robin configuration and for failover. For Interstage BPM Clusters in a round-robin configuration, requests sent to the cluster are distributed evenly among the servers in the cluster. If the cluster is configured for failover, a working server in the cluster automatically "takes over for" a server in the cluster that has just failed for some reason.

D.1 Setting Up an Interstage BPM Cluster on WebSphere Application Server 6.1

This section provides instructions for configuring a cluster of Interstage BPM Servers on WebSphere Application Server 6.1.

Interstage BPM for WebSphere is installed as a WebSphere Application Server. Therefore, when you cluster instances of Interstage BPM for WebSphere, you must cluster them as you would any set of WebSphere Application Servers.

You must use the WebSphere Application Server 6.1 Network Deployment (ND) Edition to cluster WebSphere Application Servers. The WebSphere Deployment Manager and the clustered Application Servers form a cell. When Application Servers are part of a cell, they are called managed nodes.

The sample system used to illustrate the instructions in this section consists of three computers. It has two managed nodes `IBPMHST1` and `IBPMHST2` and a Deployment Manager that resides on a separate computer with hostname `DMGRHST`. The following figure shows the sample system.

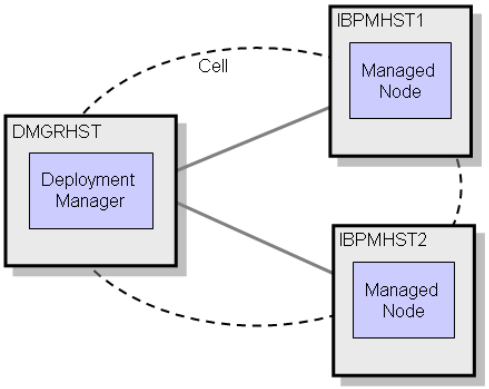

Figure 37: Sample Cluster

Setting up the cluster consists of the following major steps:

1. Preparing the cluster. This involves installing the WebSphere Application Servers and the Deployment Manager as well as installing Interstage BPM on the Deployment Manager.
2. Adding managed nodes
3. Adding a cluster.
4. Configuring the required environment variables.
5. Deploying Interstage BPM applications to the cluster
6. Deploying Interstage BPM data sources and resources to the cluster.
7. Configuring service integration buses.
8. Configuring JMS settings.
9. Configuring the JDBC driver.
10. Defining a virtual host.
11. Setting up the Interstage BPM environment.
12. Updating the Interstage BPM Server configuration.
13. Updating the Interstage BPM Client configuration.
14. Configuring the Shared Resource Root.
15. Configuring JVM parameters.
16. Starting the cluster.
17. Implementing failover if you require this feature.

The next sections provide step-by-step instructions on how to set up the cluster.

D.1.1 Preparing the Cluster

Prerequisite: All cluster nodes can reach each other via IP multicast. For you to check whether multicasts are available in the target environment, perform the following steps:

1. Run the following script on each node of the cluster:

Operating System	Multicast Receiver Script
Windows	`startMulticastReceiver.bat`
Solaris Linux	`startMulticastReceiver.sh`

   This script file is located in `<Interstage BPM Server Installation Directory>/server/deployment/bin`.

2. Run the following script on one node of the cluster and check whether all nodes in the cluster are receiving the multicasts:

Operating System	Multicast Sender Script
Windows	`startMulticastSender.bat`
Solaris Linux	`startMulticastSender.sh`

This script file is also located in `<Interstage BPM Server Installation Directory>/server/deployment/bin`.

3. Stop the execution of the multicast sender script. If there are any remaining nodes that were not tested, repeat step 2 for them.

In case of any problems, contact your network administrator to make sure that the network is IP multicast enabled.

To prepare the cluster:

1. Install the WebSphere Application Server on all computers that you want to include as managed nodes in your cluster. Also, install the WebSphere Deployment Manager.

   For installation instructions, refer to the WebSphere product documentation.

   Example: If you want to set up the sample cluster, install WebSphere Application Server on computer `IBPMHST1` and `IBPMHST2`. On `DMGRHST`, install the WebSphere Deployment Manager.

2. Install Interstage BPM for WebSphere on the computer where the WebSphere Deployment Manager has been installed. Use the installation instructions in chapter *Installing and Deploying Interstage BPM Server with Console, OR only the Interstage BPM Server* on page 23 with the following exceptions:

   - Specify an installation path that can be used on all computers in the cluster.

     Example on Windows: If you install Interstage BPM in `C:\Fujitsu\InterstageBPM` on the Deployment Manager computer, it will be deployed to `C:\Fujitsu\InterstageBPM` on all computers in the cluster.

     Example on Solaris: If you install Interstage BPM in `/opt/FJSVibpm` on the Deployment Manager computer, it will be deployed to `/opt/FJSVibpm` on all computers in the cluster.

     Example on Linux: If you install Interstage BPM in `/opt/FJSVibpm` on the Deployment Manager computer, it will be deployed to `/opt/FJSVibpm` on all computers in the cluster.

   - On the **WebSphere <Version> Application Server Configuration** screen, specify a node, a cell and a server that do not exist.

     Example:`dummyNode01`, `dummyNode01Cell`, `dummyserver1`

     When specifying a non-existent node, cell and server, the Interstage BPM Deployment Tool creates a directory structure containing the Interstage BPM applications to be deployed to the cluster. In a later step, you will configure these applications before deploying them.

Note: Do not specify an existing node, cell or server. If you do so, the Deployment Tool deploys Interstage BPM to the specified location, which is wrong for a cluster installation.

3. Start the WebSphere Application Server on all computers that will be part of the cluster. To do so, use the following commands:

```
cd <WebSphere Installation
Directory>/AppServer/profiles/AppSrv<Number>/bin
startServer <server>
```

   Example: `startServer server1`

D.1.2 Adding Managed Nodes

To prepare for clustering your computers into a cell, you must add your computers as managed nodes.

To add the managed nodes for the cell:

1. Start the Administrative Console for the WebSphere Deployment Manager:

   `http://<hostname>:<port>/ibm/console`

   If you are following the example, you start the Administrative Console on `DMGRHST` using the following URL:

   `http://dmgrhst:9060/ibm/console`

2. Expand **System administration** and click **Nodes**.
3. Add a new node as follows:
   a) Click **Add Node**.
   b) Select **Managed Node** and click **Next**.
   c) In the **Host** field, enter the host name or IP address of one of your node computers.

      Example: `IBPMHST1`

   d) Select the **Include applications** and **Include buses** check boxes, but leave the other settings as default. Click **OK**.
   e) On Windows, select the **Run node agent as Windows service** check box. Click **OK**.

   It may take several minutes for the Deployment Manager to add the node. Wait while this configuration is in progress.

   Example: If you are following the example, the computer `IBPMHST1` is added as node `ibpmhst1Node01`. This node appears on the **Nodes** page.
4. Make sure that the node is configured correctly. This is indicated by the green color of the status icon. If the status icon displays a red color, select the node and click **Synchronize**.

   If the synchronization works, a message is displayed to that effect, and the status icon displays a green color.
5. Repeat steps 3-4 to add the other computers of your cluster as managed nodes.

   Example: If you are following the example, add the computer `IBPMHST2` as node `ibpmhst2Node01`.

D.1.3 Adding a Cluster

Prerequisite: You have added the managed nodes that will be part of your cluster.

To add a cluster:

1. In the Administrative Console for the WebSphere Deployment Manager, expand **Servers** and click **Clusters**.
2. Click **New**.
3. Enter a name for your new cluster, for example `IBPMCluster`. Click **Next**.
4. Enter a name for the cluster member and select one of your nodes from the drop-down list.

   If you are following the example, enter `IBPMMember1` and select `ibpmhst1Node01(ND 6.1.0.9)`.
5. Change the weight to 1 and click **Next**.
6. Add the other nodes as members of your cluster. For each member, set the weight to 1. Then, click **Next**.

   If you are following the example, enter `IBPMMember2` and select `ibpmhst2Node01(ND 6.1.0.9)`.
7. On the **Summary** page, check to make sure that the actions displayed are correct, then click **Finish** to create the cluster.

8. In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.

D.1.4 Configuring Environment Variables

To configure the required environment variables:

1. Edit the environment variable script located in `<Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster`:

Operating System	Environment Variable Script
Windows	`setIBPMenv.cmd`
Solaris Linux	`setIBPMenv.sh`

2. Provide the appropriate values for the following variables:

Environment Variable	Description
`CLUSTERNAME`	Cluster name that you defined in the Administrative Console for the WebSphere Deployment Manager. Example: `CLUSTERNAME=IBPMCluster`
`DATABASE_PASSWORD`	Password of the database user account that you defined during deployment of the Interstage BPM Server. Note: The password is required to deploy the Interstage BPM data sources and to import the updated server configuration into the database. When the cluster setup is complete, you can remove the password from the file.
`SERVERNAME`	Symbolic name of a cluster server. The specified name will be appended to the name of some server parameters in order to make those names unique in a cluster environment. You will configure this name later.
`SERVER_NAME`	Server name that you defined in the Administrative Console for the WebSphere Deployment Manager. You will configure this name later.
`NODE_NAME`	Node name that you defined in the Administrative Console for the WebSphere Deployment Manager. You will configure this name later.

Environment Variable	Description
CELL_NAME	Name of the cell to which the Deployment Manager and the cluster nodes belong. To determine the cell name, in the Administrative Console for the WebSphere Deployment Manager, go to **System administration** > **Cell**. Example: CELL_NAME=dmgrhstCell01

D.1.5 Deploying Interstage BPM Applications To the Cluster

Prerequisites:

- You have defined a cluster and added the members to the cluster using the Administrative Console for the WebSphere Deployment Manager.
- You have configured the required environment variables as explained in section *Configuring Environment Variables* on page 121.

To deploy Interstage BPM to the cluster:

1. On the Deployment Manager computer, run the deployment script located in <Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster:

   On Windows: Deploy.bat

   On Solaris: Deploy.sh

   On Linux: Deploy.sh

   The script deploys the server application to the cluster.

2. Resynchronize all nodes with the Deployment Manager repository. To do so:
   a) Open the Administrative Console for the WebSphere Deployment Manager.
   b) Expand **System administration** and click **Nodes**.
   c) Select all nodes of your cluster and click **Full Resynchronize**.

D.1.6 Deploying Interstage BPM Data Sources and Resources To the Cluster

Prerequisite: You have configured the required environment variables as explained in section *Configuring Environment Variables* on page 121.

To deploy the Interstage BPM data sources and resources to the cluster:

1. On the Deployment Manager computer where you installed Interstage BPM, update your environment:
   a) Edit the environment variable script located in <Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster:

      On Windows: setIBPMenv.cmd

      On Solaris: setIBPMenv.sh

      On Linux: setIBPMenv.sh

   b) Set the NODE_NAME and SERVER_NAME parameters to the values of one of your nodes.

You can determine the correct values in the Administrative Console for the WebSphere Deployment Manager. Go to **Servers** > **Clusters** > **<Name of Your Cluster>** > **Cluster members**. The **Cluster members** page displays the node name and the member name, which corresponds to the server name.

Example:

```
NODE_NAME=ibpmhst1Node01
SERVER_NAME=IBPMMember1
```

2. On the Deployment Manager computer, run the relevant datasource deployment script located in `<Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster`:

Operating System	Datasource Deployment Script
Windows	When using Oracle: `RunJaclOracle.bat`
Solaris	When using Oracle: `RunJaclOracle.sh`
Linux	When using Oracle: `RunJaclOracle.sh`

3. On the Deployment Manager computer, run the resource installation script located in `<Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster`:

   On Windows: `installResources.bat`

   On Solaris: `installResources.sh`

   On Linux: `installResources.sh`

4. Repeat steps 1-3 for the other nodes of your cluster.

   If you are following the example, use the following values in the environment variable script:

```
NODE_NAME=ibpmhst2Node01
SERVER_NAME=IBPMMember2
```

5. In the Administrative Console for the WebSphere Deployment Manager, resynchronize all nodes with the Deployment Manager repository. To do so, use **System administration** > **Nodes** > **Full Resynchronize**.

D.1.7 Configuring Service Integration Buses

To configure service integration buses:

1. In the Administrative Console for the WebSphere Deployment Manager, delete some local topic destinations that are not used in a cluster. To do so:
   a) Expand **Service integration** and click **Buses**.

      A list of buses appears on the **Buses** page.

   b) Click the bus that is configured for one of your nodes.

      Example: If you are following the example, click `ibpmhst1Node01IBPMBuss`.

   c) On the **Configuration** tab, click **Destinations**.
   d) Delete the following topics from the **Destinations** page:
      - `JmsNotification.Topic.Space`

- `SQNotification.Topic.Space`

e) In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.

f) Return to the **Buses** page and repeat substeps b-e for all nodes of your cluster.

2. Return to the **Buses** page and click **New** to create a new bus. Enter a name of your choice, for example `IBPMDistBus`. Then, click **Finish** and **Save**.
3. Add the servers of your cluster as members of the new bus. To do so:
   a) On the **Buses** page, click the name of the new bus.
   b) On the **Configuration** tab, click **Bus members**.
   c) Click **Add**.
   d) From the **Server** dropdown-list, select a server of your cluster. Then, click **Next**.
   If you are following the example, select `ibpmhst1Node01:IBPMMember1`.
   e) Make sure that **File Store** is selected as the message store. Then, click **Next**.
   f) Use the default message store properties and click **Next**.
   g) Click **Finish**.
   h) In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.
   i) Repeat substeps c-h for the remaining servers of your cluster.
   If you are following the example, add `ibpmhst2Node01:IBPMMember2` as another bus member.
4. Create the required topic destinations for the new bus. To do so:
   a) Return to the **Buses > <Your newly created bus>** page, for example **Buses > IBPMDistBus**.
   b) On the **Configuration** tab, click **Destinations**.
   c) Create the following destinations of type **Topic space** for this bus:
      - `JmsNotification.Topic.Space`
      - `SQNotification.Topic.Space`
   d) In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.

D.1.8 Configuring JMS

To configure the JMS settings for your cluster:

1. In the Administrative Console for the WebSphere Deployment Manager, expand **Resources** > **JMS** and click **JMS providers**.
2. From the scope list, select a node of your cluster.
   Example: If you are following the example, select `ibpmhst1Node01`.
3. Click **Default messaging provider**.
4. On the **Configuration** tab, click **Connection factories**.
5. Click **New** to create a new connection factory. Enter the following settings:
   - **Name**: If you are following the example, use `iFlowDistFactory`.
   - **JNDI name**: If you are following the example, use `iFlow/jms/TopicDistConnectionFactory`.
   - **Bus name**: Select the bus that you previously created.

If you are following the example, select `IBPMDistBus`.

- **Provider endpoints**: Enter the nodes of your cluster as a comma-separated list using the following syntax:

  `<Hostname_1>:<Port>:BootstrapBasicMessaging,<Hostname_n>:<Port>:BootstrapBasicMessaging`

  If you are following the example, enter:

  `IBPMHST1:7278:BootstrapBasicMessaging,IBPMHST2:7278:BootstrapBasicMessaging`

Note: To determine the correct port number, go to **Servers** > **Application Servers** > **<Server Name>** > **Ports**. Check the port number of the `SIB_ENDPOINT_ADDRESS` port.

For the other settings, use the default values.

6. Make sure that each JMS topic is mapped to the correct bus. To do so:
   a) Return to the **JMS providers > Default messaging provider** page and click **Topics**.
   b) Click the name of the topic and check the **Bus name** setting.

   These are the correct settings:

JMS Topic	Bus Name Settings
`iFlowNotificationTopiciFLowSQNotificationTopic`	Map these topics to the bus that you previously created, for example to `IBPMDistBus`.
All other topics	These topics are mapped to the bus that has been automatically created for the node that you are currently configuring, for example to `ibpmhst1Node01IBPMBuss`. Do not change this mapping.

7. Update the activation settings. To do so:
   a) Return to the **JMS providers > Default messaging provider** page and click **Activation specifications**.
   b) Map each of the following topics to the bus that you previously created:
      - `NotificationTopic`
      - `SQNotificationTopic`

      To do so, click the name of the topic and change the **Bus name** setting.

      If you are following the example, map these topics to `IBPMDistBus`.
8. Repeat steps 2-7 for all nodes of your cluster.
9. In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.

D.1.9 Configuring the JDBC Driver

Every node needs access to the JDBC driver of the database that you are using.

To configure the JDBC Driver:

1. In the Administrative Console for the WebSphere Deployment Manager, expand **Resources** > **JDBC** and click **JDBC Providers**.
2. From the scope list, select a server of your cluster.

Example: If you are following the example, select `Node=ibpmhst1Node01, Server=IBPMMember1`.

3. Click **iFlowJDBCProvider**.
4. Check the classpath and make sure that the JDBC driver is in the path on that node. If it is not in the specified location, either change the path or copy the driver file to that location.

   For more information about the required driver files, refer to section *Database Server Preparation* on page 18.
5. Repeat steps 2-4 for all servers of your cluster.

D.1.10 Defining a Virtual Host

You need to define a virtual host in order to access the Interstage BPM Configuration Tool.

To define a virtual host:

1. In the Administrative Console for the WebSphere Deployment Manager, expand **Environment** and click **Virtual Hosts**.
2. Click **New** to create a virtual host. Enter a name of your choice, for example `IBPMHost`.
3. Click the name of the new virtual host, then click **Host Aliases**.
4. Create a new alias with * as the host name and a free port number, for example 9081.
5. In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.
6. Expand **Applications** and click **Enterprise Applications**.
7. Click **InterstageBPMClusterApplication**.
8. On the **Configuration** tab, click **Virtual hosts**. Assign the virtual host that you created to the `IBPMConfigServletWebApp` Web module.
9. In the message at the top of the page, click **Review**. Select **Synchronize changes with Nodes** and click **Save** to save the configuration.

The Interstage BPM Configuration Tool is now available on each node at `http://<hostname>:<virtual host port>/fujitsu-ibpm-config-webapp/IBPMConfigServlet`, for example `http://ibpmhst1:9081/fujitsu-ibpm-config-webapp/IBPMConfigServlet`.

D.1.11 Setting Up the Interstage BPM Environment for the Cluster

To set up the Interstage BPM environment for the cluster:

1. Copy the entire contents of `<Interstage BPM Server Installation Directory>` from the Deployment Manager computer to `<Interstage BPM Server Installation Directory>` on all cluster nodes **except the following directory:**

   `InterstageBPMServer.ear`

Note: The path to the installation directory of the Interstage BPM Server must be the same on all cluster nodes.

   If you are following the example, copy the contents from the `DMGRHST` computer to the nodes `IBPMHST1` and `IBPMHST2`.
2. On each cluster node, update the environment as follows:
   a) Edit the environment variable script located in `<Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster`:

      On Windows: `setIBPMenv.cmd`

On Solaris: `setIBPMenv.sh`

On Linux: `setIBPMenv.sh`

b) Set the `NODE_NAME`, `SERVER_NAME`, and `SERVERNAME` parameters to the correct values of that cluster node.

The `SERVERNAME` parameter is used to identify the cluster node's configuration within Interstage BPM. Make sure that the specified name is unique in the cluster. To achieve this, you could use the same value as for the node name.

Example: If you are following the example, on `IBPMHST1`, set the parameters to:

```
NODE_NAME=ibpmhst1Node01
SERVER_NAME=IBPMMember1
SERVERNAME=ibpmhst1Node01
```

On `IBPMHST2`, set the parameters to:

```
NODE_NAME=ibpmhst2Node01
SERVER_NAME=IBPMMember2
SERVERNAME=ibpmhst2Node01
```

D.1.12 Updating the Interstage BPM Server Configuration

Prerequisites:

- On each cluster node, you have updated the environment variables as explained in section *Setting Up the Interstage BPM Environment for the Cluster* on page 126.
- The database server is running.

You must change some server configuration settings to complete the cluster's server configuration.

To update the Interstage BPM Server configuration:

1. **On each of the cluster nodes**, from the database, export system level server configuration parameters into a configuration file (<filename>.`properties`).

Operating System	Configuration Import Script
Windows	`exportProperties.bat <filePath> <Database User Name> <Password>`
Solaris Linux	`exportProperties.sh <filePath> <Database User Name> <Password>`

Note: Before you make any changes to the Server configuration, make a copy of the server configuration file you exported as a back-up. In case you make errors while editing parameters, Interstage BPM Server may not be able to start or errors may occur at runtime. In such a case you can import the back-up file which contains a working configuration.

2. On **each cluster node**, add the following entries to the configuration file:

```
ServerName=<Hostname>
ServerSharedRoot=<Path of shared ResourceRoot in file server>
```

Example:

These are the settings on `IBPMHST1`:

```
ServerName=IBPMHST1
ServerSharedRoot=//MyFileServer/InterstageBPMShared/
```

These are the settings on `IBPMHST2`:

```
ServerName=IBPMHST2
ServerSharedRoot=//MyFileServer/InterstageBPMShared/
```

3. On **any one** of the cluster nodes, add the following entry to the configuration file `ibpm.properties` located in `<Interstage BPM Server Installation Directory>/server/instance/default`:

```
ServerInCluster=true
```

4. Check the default settings for the multicast group.

   A multicast group is used to distribute information among the Interstage BPM Servers in a cluster. These are the default settings used by the Interstage BPM Servers:

   - Multicast port number: 5000
   - Multicast group address: 225.4.5.6

     A multicast group address is an IP address in the range 224.0.0.0 to 239.255.255.255, inclusive. It is used to identify the members of a multicast group. Each member of the group uses the same multicast group address. The address 224.0.0.0 is reserved and must not be used.

   If you want to change the default settings, add the relevant parameters to the configuration file **on one** of the cluster nodes:

```
ClusterMulticastPort=<Multicast Port Number>
ClusterMulticastTopic=<Multicast Group Address>
```

Note: If already present in the configuration file, ensure these parameters are not empty.

Note: As the multicast parameters are identical for all cluster servers, you only need to add them to the configuration file on one of the cluster nodes.

5. On each cluster node, make sure that all of the parameters listed below are set in the configuration file and have the values specified below. If a parameter is not present in the configuration file, you need to add it to the file.

```
JmsNotificationTopic=iFlow/jms/TopicDistConnectionFactory,iFlow/jms/NotificationTopic
JmsSQNotificationTopic=iFlow/jms/TopicDistConnectionFactory,iFlow/jms/sq/SQNotificationTopic
JmsNamingProviderURL=corbaname::<HOSTNAME_1>:<BootstrapPort>,:<HOSTNAME_n>:<BootstrapPort>#cell/clusters/<ClusterName>


ServerHost=<HOSTNAME>
```

Example: If you are following the example, on `IBPMHST1`, set the parameters to:

```
JmsNotificationTopic=iFlow/jms/TopicDistConnectionFactory,iFlow/jms/NotificationTopic
JmsSQNotificationTopic=iFlow/jms/TopicDistConnectionFactory,iFlow/jms/sq/SQNotificationTopic
JmsNamingProviderURL=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster
```

```
ServerHost=IBPMHST1
```

On `IBPMHST2`, set the parameters to:

```
JmsNotificationTopic=iFlow/jms/TopicDistConnectionFactory,iFlow/jms/NotificationTopic
JmsSQNotificationTopic=iFlow/jms/TopicDistConnectionFactory,iFlow/jms/sq/SQNotificationTopic
JmsNamingProviderURL=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster


ServerHost=IBPMHST2
```

6. On each cluster node, also ensure the values of the following node-specific properties are correct:
   - `KPIListenerConfigFile`
   - `ServerBaseURL`
   - `ServerEmailBaseURL`
   - `ServerName`
   - `ServerRoot`
7. Before importing the configuration file to the database, delete the older system properties from the database (from the `IBPMProperties` table) using the following SQL command:

```
DELETE FROM IBPMProperties WHERE tenantId = -1
```

8. On each cluster node, run the configuration import script located in `<Interstage BPM Server Installation Directory>/server/deployment/WAS-Cluster`:

Operating System	Configuration Import Script
Windows	`importProperties.bat <File Name> <DB UserName> <Password>`
Solaris Linux	`importProperties.sh <File Name> <DB UserName> <Password>`

The script imports the configuration file into the database. During import, the string `<Hostname>.<Server Name>` is appended to some of the parameter names in order to make those names unique in a cluster environment.

For example, when importing the configuration file on `IBPMHST1`, the entry `ServerLogFile=<Path>` is transformed into `ServerLogFile.IBPMHST1.ibpmhst1Node01=<Path>`. Likewise, when importing the configuration file on `IBPMHST2`, the entry is transformed into `ServerLogFile.IBPMHST2.ibpmhst2Node01=<Path>`.

D.1.13 Updating the Interstage BPM Client Configuration

Interstage BPM Server comes with a client configuration file, which is used by Interstage BPM Clients to connect to the server. You need to update the client configuration file so that the client connects to one of the cluster servers.

To update the client configuration:

- On each cluster node, update the following parameters in the configuration file `iFlowClient.properties` located in `<Interstage BPM Server Installation Directory>/client`:

```
JmsFactory=iFlow/jms/TopicDistConnectionFactory

java.naming.provider.url=corbaname::<HOSTNAME_1>:<BootstrapPort>,:<HOSTNAME_n>:<BootstrapPort>#cell/clusters/<ClusterName>
NamingProviderURL=corbaname::<HOSTNAME_1>:<BootstrapPort>,:<HOSTNAME_n>:<BootstrapPort>#cell/clusters/<ClusterName>
JmsNamingProviderURL=corbaname::<HOSTNAME_1>:<BootstrapPort>,:<HOSTNAME_n>:<BootstrapPort>#cell/clusters/<ClusterName>

HostName=<HOSTNAME>
ServerName=<HOSTNAME>
```

For `java.naming.provider.url`, `NamingProviderURL` and `JmsNamingProviderURL`, specify the addresses of all nodes in your cluster. Specify the `BOOTSTRAP_ADDRESS` port as the port number.

Example: If you are following the example, on `IBPMHST1`, set the parameters to:

```
JmsFactory=iFlow/jms/TopicDistConnectionFactory

java.naming.provider.url=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster
NamingProviderURL=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster
JmsNamingProviderURL=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster

HostName=IBPMHST1
ServerName=IBPMHST1
```

On `IBPMHST2`, set the parameters to:

```
JmsFactory=iFlow/jms/TopicDistConnectionFactory

java.naming.provider.url=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster
NamingProviderURL=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster
JmsNamingProviderURL=corbaname::IBPMHST1:2809,:IBPMHST2:2809#cell/clusters/IBPMCluster

HostName=IBPMHST2
ServerName=IBPMHST2
```

D.1.14 Configuring the Shared Resource Root

The ResourceRoot is a directory on a central server containing resources (such as workflow applications, file listeners, shared classes, and so on).

In a load-balancing system, the ResourceRoot directory must be located on a central server that can be accessed by all server nodes; all server nodes must use the same ResourceRoot directory.

Each server node must be configured to access the ResourceRoot directory on that central server. The server nodes are allowed to map those directories to different physical paths as long as they use the same symbolic name for the directory.

To configure your ResourceRoot:

1. On a central server, create a ResourceRoot directory. Make sure that all server nodes have read and write access to this directory.

   Example: In the sample system, a file server is used to host the ResourceRoot directory. You could create a directory named `InterstageBPMShared`.

2. Create the `tenants/Default/` folders under the ResourceRoot directory.

   For example, `//MyFileServer/InterstageBPMShared/tenants/Default/`

3. Do the following:
   a) From the WebSphere Deployment Manager computer's `<Interstage BPM Installation Directory>/server/instance/default/tenants/Default/` directory, **move** the following folders to the `tenants/Default/` folder under the ResourceRoot directory.
      - `apps`
      - `attachments`
      - `classes`
      - `dmsroot`
      - `lib`
   b) Also delete the folders listed above from the other server nodes.
4. On Windows, **on each server node**, update the `<Path>` tag of `DmsCollections.xml` file located in `<Interstage BPM Server Installation Directory>/server/instance/default/tenants/Default/resources` to specify the `attachments` directory on the file server.

   Use one of the following formats to specify the directory's path:

   ```
   //<Remote Computer Name>/<Directory Name>/
   \\<Remote Computer Name>\<Directory Name>\
   ```

   Example:

   ```
   <DmsCollections>
   <Dms>

   <Path>//MyFileServer/InterstageBPMShared/tenants/Default/attachments</Path>


   <ImplementationClass>com.fujitsu.iflow.dmsadapter.impl.FileSystemDmsSessionImpl

     </ImplementationClass>
     <Name>Attachments</Name>
    </Dms>
   </DmsCollections>
   ```

Note: Do not use a network drive in the path specification. (For example, like in `<Path>P:\InterstageBPMShared\tenants\Default\attachments</Path>`). Network drives cannot be accessed by the Interstage BPM Server.

5. Perform the subsequent steps if you are installing on the following operating system:
   - Solaris
   - Linux

   a) On each server node, mount the `attachments` directory that you copied on the file server.
   b) On each server node, update the `DmsCollections.xml` file located in `<Interstage BPM Server Installation Directory>/server/instance/default/tenants/Default/resources` to specify the `attachments` directory on the file server.

   Example: If you mount the shared directory at `mp1`, you would update the `DmsCollections.xml` file to look like the following:

   ```
   <DmsCollections>
   <Dms>
   ```

```
  <Path>/mp1/attachments</Path>

<ImplementationClass>com.fujitsu.iflow.dmsadapter.impl.FileSystemDmsSessionImpl

  </ImplementationClass>
  <Name>Attachments</Name>
</Dms>
</DmsCollections>
```

The DMS root directory's mount point may be different on the individual server nodes. However, the directory's symbolic name, which is specified in the `<Name>` element, must be the same on all server nodes. The following figure shows this configuration:

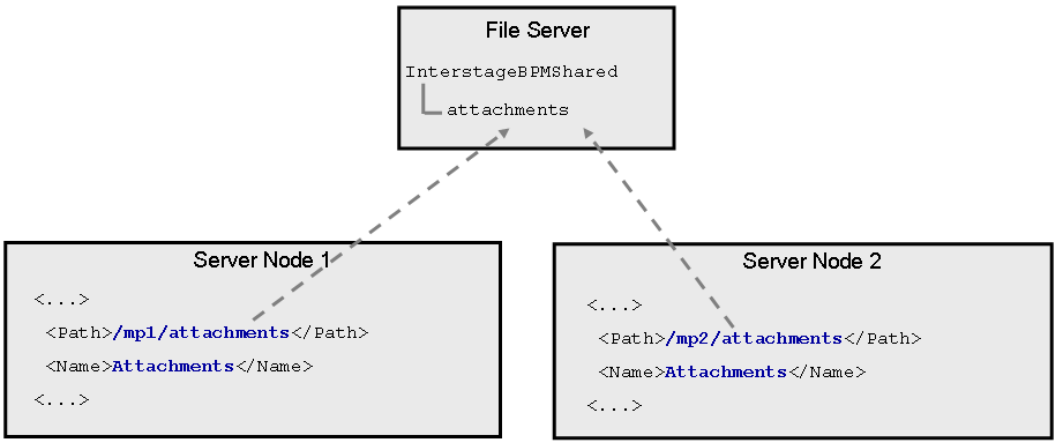

Figure 38: Sample DMS Configuration

D.1.15 Configuring JVM Parameters

To configure JVM parameters of the servers in your cluster:

1. In the Administrative Console for the WebSphere Deployment Manager, expand **Servers** and click **Application servers**.
2. Select a server of your cluster, for example `IBPMMember1`.
3. On the **Configuration** tab, expand **Java and Process Management** and click **Process Definition**.
4. Click **Java Virtual Machine**.
5. In the **Generic JVM arguments** field, enter the following value:

   `Dibpm.nodename=<Server Name>`

   For `<Server Name>`, specify the value of the `SERVERNAME` parameter that you specified in the environment variable script. For more information, refer to section *Setting Up the Interstage BPM Environment for the Cluster* on page 126.

   Example: If you are following the example, specify `Dibpm.nodename=ibpmhst1Node01`.
6. Repeat steps 2-5 for the other servers of your cluster.

   Example: If you are following the example, repeat the steps for `IBPMMember2` specifying `Dibpm.nodename=ibpmhst2Node01` as a JVM argument.

D.1.16 Starting the Cluster

To start the Interstage BPM Cluster:

1. Start the node agent on all nodes of your cluster:

```
cd <WebSphere Installation
Directory>/AppServer/profiles/AppSrv<Number>/bin
startNode
```

2. Start the cluster itself. To do so:
   a) In the Administrative Console for the WebSphere Deployment Manager, expand **Servers** and click **Cluster**.
   b) Select your cluster and click **Start**.

   It may take several minutes for the cluster to start. The status icon in the **Status** column displays the current startup status.

D.1.17 Implementing Failover

During operation, events are created and written to the database by each server node. Events are tied to the server node that created them and will be processed by this server node. If a server node goes down, remaining events tied to this node will not be processed. The processing of such events is resumed only when the server node is available again.

You can implement a failover mechanism such that events that cannot be processed are transferred to other server nodes in the load-balancing system. To do so, you create a custom Java application that performs the following operations:

- Create an administration session, that is a `WFAdminSession` object.
- Call `recoverEvents(serverName)` to transfer events from the server node that is passed as an argument to the other server nodes.

For general information on how to create a Model API application, refer to the *Interstage Business Process Manager Developer's Guide*. Details on `WFAdminSession` and `recoverEvents()` can be found in the API Javadoc documentation.

Example

This example demonstrates the processing of events in case one of two server nodes fails.

A sample load-balancing system with two server nodes has been set up. While all of the server nodes are up and running, events are created and written to the database by each server node.

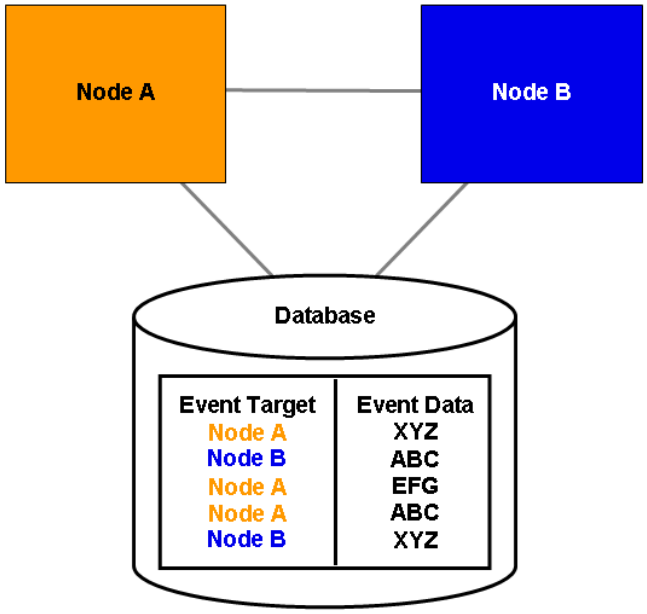

Figure 39: All Server Nodes are Up and Running

If Node A goes down, events remain assigned to that node and are waiting to be processed.

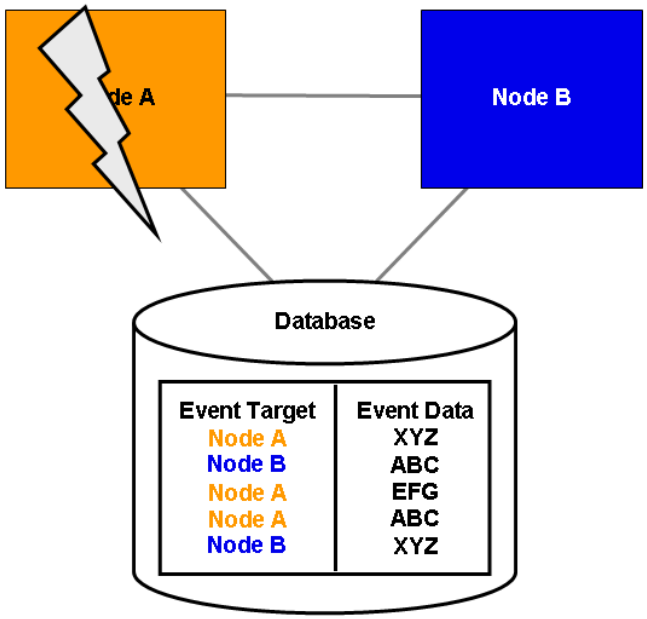

Figure 40: Server Node Goes Down

After executing `recoverEvents("Node A")`, all remaining events of Node A are transferred to and processed by Node B.

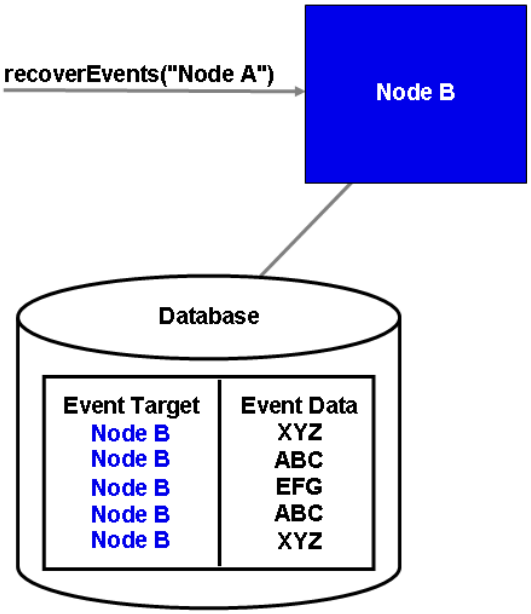

Figure 41: Events are Transferred to Another Node

Appendix E: Troubleshooting

E.1 Log File Information

If Interstage BPM does not seem to be working properly, check the following log files:

- `IBPMServer.log` - all errors from the server and the Interstage BPM adapters are logged in this file. This log file is often very helpful in troubleshooting. For example, it may indicate that the database server is down.
- `AnalyticsError.log` - all analytics errors are logged in this file.

These files are located at the following location on the Interstage BPM Server computer: `<Interstage BPM Server Installation Directory>/ server/instance/default/logs`

E.2 Resolving Specific Error Situations

E.2.1 Interstage BPM Server Fails to Start

Check the `IBPMServer.log` in the `<Interstage BPM Server Installation Directory>/server/instance/default/logs` directory.

Look for	What to do
`DbService : setConnection: Connection to database server failed. Is the database server running and reachable through the network? {ORA-01089: immediate shutdown in progress - no operations are permitted.`	Check if the database is running. Also check that you can access the database from the machine where the Interstage BPM Server is installed in case the database is running on a different machine. You can use `telnet <Database Server Hostname> <Port>` from the server host machine to check that the connection to the database host/port can be established.

`LdapBroker : getContext: Could not create the directory services. {[LDAP: error code 49 - Invalid Credentials]}`
`LdapBroker : getGroupMembersByDN: Could not retrieve the user groups. {Could not create the directory services. {[LDAP: error code 49 - Invalid Credentials]}}`
`LdapBroker : Could not retrieve the user groups. {Could not create the directory services. {[LDAP: error code 49 - Invalid Credentials]}}`
	Ensure that the user name/password as specified in the `LDAPAccessUserID / LDAPAccessUserPassword` parameters of the Interstage BPM Server are correct and you can login to your Directory Server using the above user name/password.

Look for	What to do

`getContext: Could not create the directory services.`
`LdapBroker : getGroupMembersByDN: Could not retrieve the user groups. {Could not create the directory services.`
`LdapBroker : Could not retrieve the user groups. {Could not create the directory services.`
	Ensure that the LDAP Server is running on the port as specified in the `LDAPServer` parameter of the Interstage BPM Server. You can use `telnet ldapServerHostName port` from the server host machine to check that the connection to the host/port can be established.

`IflowStartup : @(Failed to execute the IBPM startup routine task)Unable to deliver the message for the requested eventClass. {javax.naming.ServiceUnavailableException: A communication failure occurred while attempting to obtain an initial context with the provider URL: "iiop://<ServerName>:<Ports>". Make sure that any bootstrap address information in the URL is correct and that the target name server is running. A bootstrap address with no port specification defaults to port 2809. Possible causes other than an incorrect bootstrap address or unavailable name server include the network environment and workstation network configuration.}`	This is because you installed WebSphere Application Server in a Cell (deployment manager and a managed node) environment, causing the `BOOTSTRAP_ADDRESS` port to be incorrect in some configuration files. 1. Get the correct value of the `BOOTSTRAP_ADDRESS` port from the WebSphere Application Server Console (from **Servers** > **Application Servers** > <ServerName> > **Ports**). 2. Update the value of the `BOOTSTRAP_ADDRESS` port for the following entries in the `iflowClient.properties`, `ibpm.properties` files, as well as Interstage BPM properties in the database: • `JMSNamingProviderURL` (in the format `iiop://<Host Name>:<BOOSTRAP_ADDRESS>`) • `NamingProviderURL` (in the format `iiop://<Host Name>:<BOOSTRAP_ADDRESS>`)

E.2.2 Error in IBPMServer.log

Check the `IBPMServer.log` in the `<Interstage BPM Server Installation Directory>/server/instance/default/logs` directory.

Look for	What to do
`getGroupMembersByDN: Could not retrieve the user groups. {[LDAP: error code 32 - No Such Object]}`	Possible cause of this error: A user has been deleted from the Directory Server (LDAP Server) but the reference of it is still there in one of the groups.

E.2.3 Timeout During JavaScript Execution

When executing large JavaScripts, the transaction timeout currently set for WebLogic and WebSphere application servers (120 seonds) is insufficient. Due to this setting, script execution may fail with a "transaction timeout".

Your application server administrator can increase the transaction timeout depending on your usage requirements, for example, to 200 seconds. This setting can be changed in the following location:

- WebLogic application server:

  <WebLogic install dir>/../config/config.xml/<jta>/<timeout-seconds>

- WebSphere application server:

  In the WebSphere Console: **Servers** -> **ApplicationServers** -> **server1** (default name) -> **Container Services** -> **Transaction Services** -> **Total Transaction lifetime timeout**.

E.2.4 Failure in Writing to an Oracle Database

When the updting of an Oracle database table fails, for example, when you try to archive a process instance, check the Oracle alert log file located in the `<Oracle Installation Dir>/admin/<DB instance name>/bdump` directory, for example:

```
C:\ProgramFiles\Oracle\admin\orcl\bdump\alert_orcl.log
```

The following error may be observed:

```
{Database add/create request failed. {ORA-08103: object no longer exists}}
```

This failure may be due to the fact that the Datafile size reached the file size limit on the hard disk of the database server.

The system administrator of the database server needs to increase the file size on the database server hard disk.

E.3 Errors During Installation, Deployment and Configuration

This section lists several errors that could occur during the installation, deployment and configuration of Interstage BPM and describes the required action(s) to take:

Installation of IBPM fails when trying to install a new build

I	Cause	The build directory of the exisitng installed build was deleted, without un-installing the build or un-installation failed.

	Action	**For Windows** Manually delete the earlier build's registry-entry, as follows: 1. Go to **Start > Run**, type `regedit`, click **OK**. 2. In the **Registry Editor** screen, go to **HKEY_LOCAL_MACHINE > SOFTWARE > Fujitsu > Install > Interstage BPM Server** . 3. Delete the **Interstage BPM Server** registry entry under **Install** key. 4. Go to **HKEY_LOCAL_MACHINE > SOFTWARE > Microsoft > Windows > CurrentVersion > Uninstall >Interstage Business Process Manager xx.x**. 5. Delete the **Interstage Business Process Manager xx.x** registry entry under **Uninstall** key. This will ensure complete deletion of the registry entry for Windows platform. **For Solaris** Manually delete the Solaris package information, as follows: 1. Open the Command Prompt window and run the command `pkginfo -l FJSVibpm` from any location of the Solaris machine, to check if the Solaris package information still exists. 2. If the Solaris package information is displayed, then delete the package information using the following steps: a. Create a file named **ibpm.uninst** under the **/tmp** location. b. Run the command `pkgrm FJSVibpm` to delete the Solaris package. c. Run the command `pkginfo -l FJSVibpm` once more, to ensure that the Solaris package has been deleted successfully. If no information is displayed, then it confirms that the Solaris package has been completely deleted from the Solaris platform. **For Linux** Manually delete the RPM package information, as follows: 1. Open the Command Prompt window and run the command `rpm -qi FJSVibpm` from any location of the Linux machine, to check if the RPM package still exists. 2. If the RPM package information is displayed, then delete the package information using the command `rpm -e FJSVibpm`. 3. Run the command `rpm -qi FJSVibpm` once more to ensure that the RPM package has been deleted successfully. If no information is displayed, then it confirms that the RPM package has been completely deleted from the Linux platform.

The Interstage BPM installation program was unable to launch on Linux

I	Cause	The `libXp-1.0.0-8.i386.rpm` package is not installed on the Linux machine.

	Action	On the Linux machine, do the following: 1. Download the `libXp-1.0.0-8.i386.rpm` package from your Red Hat Enterprise Linux CD or the Red Hat Network website. 2. Install the package using the `rpm -i libXp-1.0.0-8.i386.rpm` command. 3. Retry launching the Interstage BPM installation program for Linux.

An error occurred during Interstage BPM database creation/update

I	Cause	One of the following values provided during deployment were wrong: • Database Administrator user name • Database Administrator password
	Action	Restore the database from the backup of the database made before deploying Interstage BPM. Run the Deployment Tool again and select **Database Configuration** on the **Welcome** screen. In this way, the database is configured without deploying Interstage BPM again.
II	Cause	One of the following values provided during deployment were wrong: • Host name of the database server • Database SID (database instance name) • Database port
	Action	Restore the database from the backup of the database made before deploying Interstage BPM. Remove Interstage BPM from the application server and deploy it again using the Deployment Tool.
III	Cause	Database server is not running.
	Action	Start the database server. Run the Deployment Tool again and select **Database Configuration** on the **Welcome** screen. In this way, the database is configured without deploying Interstage BPM again.

An error occurred during the execution of `importLDAP.bat`

I	Cause	One of the following values provided during deployment were wrong: • LDAP Key • LDAP Organizational Unit
	Action	Remove Interstage BPM from the application server and deploy it again using the Deployment Tool.

An error occurred during the execution of `importAD.bat`

I	Cause	One of the following values provided during deployment were wrong: • Active Directory Key • Active Directory Organizational Unit
	Action	Remove Interstage BPM from the application server and deploy it again using the Deployment Tool.

E.4 Errors during Starting the Interstage BPM Server

The following tables explain the possible causes of errors during server startup and the appropriate action(s) to take:

Errors Pertaining to Active Directory

I	Cause	The Active Directory Server is remote and Active Directory is not running.
	Action	Start the Active Directory Server, and then start the Interstage BPM Server.
II	Cause	One of the following values provided during deployment was wrong: • User name for the Directory Service Login account • Password for the Directory Service Login account These values are used in the `importAD.bat` file as arguments of the `net user` command.
	Action	Remove Interstage BPM from the application server and deploy it again using the Deployment Tool.
III	Cause	Interstage BPM cannot connect to the Active Directory Server because one of the following values provided during deployment was wrong: • Active Directory Key • Active Directory Organizational Unit
	Action	Remove Interstage BPM from the application server and deploy it again using the Deployment Tool.

Errors Pertaining to Sun Java System Directory Server

I	Cause	Interstage BPM cannot connect to the LDAP Server because one of the following values provided during deployment was wrong: • LDAP Key • LDAP Organizational Unit
	Action	Remove Interstage BPM from the application server and deploy it again using the Deployment Tool.

Errors Pertaining to the Database

I	Cause	The Database Server is not running.
	Action	Start the Database Server, and then start the Interstage BPM Server.

Errors Pertaining to a Hostname Change

I	Cause	You changed the hostname of the computer where Interstage BPM Server has been installed. As the hostname occurs in the names and values of various configuration parameters of the Interstage BPM Server, the server cannot access its configuration settings.
	Action	In the `IBPMProperties` table of the Interstage BPM database, make the following changes: • In the `PROPERTYKEY` column, update any parameter names that have the hostname in the suffix. These parameters have the format `<PARAMETER_NAME>.<HOSTNAME>` or `<PARAMETER_NAME>.<HOSTNAME>.<SERVERNAME>`. • In the `PROPERTYVALUE` column, update any parameter values containing the hostname. To update the `IBPMProperties` table, use the appropriate database commands or a database client software.

E.5 Contacting Your Local Fujitsu Support Organization

If you are unable to troubleshoot your problem:

1. Set the `DebugLevel` parameter of the Interstage BPM Server to `2` using these steps:
   a) Start the Interstage BPM Server Configuration Tool using the following URL:
   `http://<Hostname>:<Port>/fujitsu-ibpm-config-webapp/IBPMConfigServlet`
   b) Log in as an Interstage BPM Super User.
   c) Set the `DebugLevel` parameter to `2`.
   d) Click **Save and Reload properties**.
2. Replicate the actions that caused the error.
3. Contact your local Fujitsu Support organization and provide the following information:
   General Information
   - Operating System
   - Directory Service (type and version)
   - Database server (type and version)
   - JDK or JRE version
   - Application server (type and version)
   - Interstage BPM edition, version and build number
   - Major problem area
   - Priority of the issue
   - Environment in which the problem occurs

Configuration Information

- The configuration file that you exported from the Interstage BPM Server

Log Files

- All log files from `<Interstage BPM Server Installation Directory>/server/instance/default/logs`
- When using WebSphere: All log files from `<WebSphere Installation Directory>/profiles/<Your Application Server Profile>/logs/<Your Server>`

OS System Logs

- The Windows event log that you obtain using the Windows Event Viewer
- UNIX system logs stored in `/var/adm/messages`
- Linux system logs stored in `/var/log/messages`

Problem Description

- Description of the steps you performed before the problem occurred
- Frequency with which the problem occurrs

Problem Details

- The application program and its source code that caused the error
- The XPDL file of the process definition that caused the error
- Information about Java Actions, Timers and Agents defined in the process definition
- Screenshot of the process instance history if the process instance goes into error state
- Stack trace if any exception is displayed

  You can obtain the strack trace by clicking **Details** on the error page displayed in the Interstage BPM Console.
- Screenshot of the exception wherever it is displayed
- Screenshot of the process instance (graphical view) if the process instance goes into error state or into an unexpected state
- Calendar files (`*.cal`) if timers are used
- The `agentsConfig.xml` file if agents are used

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